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ABSTRACT

This two-volume report of a planning study conducted for the Corporation for Public Broadcasting presents an assessment of the opportunities and risks associated with public broadcasting's involvement in teletext and videotext. Volume 1 contains a strategic assessment that offers analysis, recommendations, and conclusions regarding the market for teletext and videotext, public television's position in that market, and actions that should be taken to maximize the position. The second volume contains two appendices with reports that form the basis for the strategic assessment, entitled "A Situational Assessment of the Teletext and Videotext Markets" and "An Institutional Assessment of Public Television's Ability to Enter New Ventures." The first provides a picture of the current marketplace, an assessment of the existing opportunities and obstacles to entrance and a perspective on future market developments and conditions. The institutional analysis examines the mission, strengths, and weaknesses of public television in relation to possible entrance into teletext or videotext ventures and identifies key issues for consideration. (LMM)

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Strategic Assessment
# of the
Teletext and Videotext Markets
for
The Corporation for Public Broadcasting

IR 011 519

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September 8, 1983

Mr. Richard Grefe
Director
Planning and Analysis
Corporation for Public Broadcasting
1111 16th Street, NW.
Washington, D. C. 20036

Dear Mr. Grefe:

Coopers & Lybrand is pleased to submit this final report to the Corporation for Public Broadcasting as a result of its "Teletext and Videotext Planning Study".

The report is bound in two volumes. This, the first volume, contains our Strategic Assessment of the Teletext and Videotext Markets. This assessment provides analysis, recommendations and conclusions regarding the market for teletext and videotext, public television's position in that market and actions that should be taken to maximize that position.

Volume Two contains two appendices:

- A Situational Assessment of the Teletext and Videotext Markets and
- An Institutional Assessment of Public Television's Ability to Enter New Ventures.

Specifically, the situational assessment provides a picture of the current marketplace, an assessment of the opportunities and obstacles to entrance that exist and a perspective on future market developments and conditions. The institutional analysis examines the mission, strengths and weaknesses of public television in relation to possible entrance into a teletext or videotext venture and identifies key issues for consideration. The combined results of these two studies formed the basis of the strategic analysis discussed above.

Our strategic analysis resulted in recommendations regarding not only the most favorable markets, roles and services for public television in this area but also institutional adjustments which are necessary for this kind of venture activity and timing of entrance. We should state upfront that as a result of this work our overall view regarding the near term viability of these markets is a skeptical one. Several technical and market related problems must be resolved before a positive determination of market potential can be made. Therefore we have attempted to be very specific throughout our work about the need for careful planning and analysis before any venture is undertaken and to point out the pros and cons of various options.

We have enjoyed working with you on this important effort and hope the results of this study provide you with a solid framework for future planning and decision making in the electronic publishing arena.

Very truly yours,

Coopers & Lybrand

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JR

Enclosures

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Preface

The Teletext and Videotext Planning Study was commissioned by the Corporation for Public Broadcasting (CPB) to assess, in the broadest possible terms, the opportunities and risks associated with public broadcasting's involvement in these programming media and delivery systems. Many public broadcasting stations had begun to pursue these opportunities independently. It was our objective to learn from those stations' experience and to offer a comprehensive assessment of the marketplace, the technical developments and our institutional strengths and weaknesses, so that experienced and inexperienced stations could make informed decisions before committing resources to these emerging media.

The planning study describes the opportunities and risks in a strategic perspective, while identifying the criteria which stations should consider before entering the teletext and videotext fields. Appropriately, the study emphasizes that the vertical blanking interval (VBI) is a valuable resource, only one use of which is the transmission of programming in teletext format. Caution is urged in committing this resource, either individually or cooperatively, even while stations explore potential public service (or revenue generating) opportunities.

For those stations that decide to develop teletext or videotext services, after the careful consideration recommended in this study, CPB will be publishing a handbook on how to implement a service, step by step, based on the experience of public broadcasting stations which have been in the lead of the technology and medium.

Richard Grefe
Director
Policy Development and Planning
Corporation for Public Broadcasting

Strategic Assessment
# of the
Teletext and Videotext Markets
for
The Corporation for Public Broadcasting

I. INTRODUCTION

This report presents Coopers & Lybrand's strategic assessment for public television of the teletext and videotext markets. The information contained in this report is based on data collected and analyzed during Phases I and II of this project: the situational assessment of the market and the institutional assessment of public television. This phase of the project, brings together the two previous phases and provides an analysis of strategic posture the purpose of which is to assist public television in determining an overall direction with regard to the emerging electronic publishing markets.

The remainder of this report is organized as follows:

- Section II - Key Findings and Recommendations
- Section III - Market Overview
- Section IV - Criteria for Ventures in Teletext and Videotext
- Section V - Determining the Strategic Position of Public Television
- Section VI - Teletext as a Viable Opportunity for Public Television

II. KEY FINDINGS AND RECOMMENDATIONS

Coopers & Lybrand's key findings and recommendations regarding public television and the teletext and videotext markets, fall into three broad categories:

- The required institutional adjustments for venture activity.
- The necessity for a more general view of the VBI as a resource.
- A segmented market analysis of teletext and videotext.

A. A More General View of the VBI

The terms of reference for this engagement consisted of the exploration of opportunities for public television specifically in the teletext and videotext markets. A more general and more appropriate approach, given the nascent status of these markets and the strengths and limitations of public television, would be to view the VBI as a resource possessed by all stations, and to determine means of maximizing the potential benefits from that resource. From this perspective, the opportunities facing public television become more numerous and more promising. For example, the VBI, integrated by a network with significant penetration, is a scarce and valuable resource for data transmission. This data may or may not be in the form of a teletext service and may or may not be tied to the demand for such a service.

Recommendations:

Pursue the use of the VBI as a resource. This recommendation involves a broad definition of what the resource is, and an active rather than reactive approach to the marketing of the resource to the public and private sectors. The implementation of this recommendation consists of four steps: (1) Examine the general product and its capacity - singularly, and in tandem with regional or national distribution networks. (2) Arrive at a general valuation of the resource. (3) Seek through requests for proposals (RFP's) proposals concerning public and private sector uses and partners. (4) Develop the capabilities needed to analyze proposals.

B. Institutional Adjustments for Venture Activity.

Consideration of any venture must include a comparison of the skills necessary to undertake that venture successfully with the skills currently available within the organization. General requirements for successful ventures include: focus, planning, entreprenuership, business skills, clear objectives and funding.

Public television was created to provide alternative programming to the television viewing public. As such, the focus, planning, skills and motivations are not necessarily consistent with those required for venture activity; especially ventures outside the scope of public service television broadcasting. To provide or augment the ability to enter ventures which are supplemental to, but perhaps not directly related to, the mission of public television, the following recommendations are provided.

Recommendations:

1. Venture management skills should be upgraded by the individual stations. Successful ventures require substantial managerial support. Prior to start-up, financial potential and risk must be rigorously analyzed. After start-up, virtually all ventures require marketing and selling expertise, and sound managerial and financial controls. Public television cannot assume that these skills can easily be developed after ventures are undertaken.

   Individual stations anticipating venture activity should assess realistically their ability to analyze and manage ventures and should improve these capabilities where weaknesses exist.

2. Public television should, in most circumstances, seek joint ventures. In virtually all circumstances, public television will lack the financial resources and the risk-taking abilities necessary for independent ventures. Moreover, public television lacks the marketing and financial management capabilities required by most earned income venture activities. A venture partner should supply capital and provide these management capabilities. Public television should assess realistically what resources it brings to a venture and how those resources can be marketed to potential partners.

3. A body to provide venture expertise for public television resources should be established. This body would bring analytic expertise and, in time, cumulative experience to augment participation in public television's ventures. Although the stations would retain the right to accept or reject specific venture activities, the venture body could: (1) initiate proposals; (2) analyze specific opportunities; (3) act as a liaison between potential venture partners and the stations; and (4) assist in contract negotiations. The terms of reference of such a group should include public and private sector ventures.

C. A Segmented Market Analysis of Teletext and Videotext.

In this analysis, markets are segmented to examine the components of demand and to explore those components for unmet needs and opportunities. Such segmentation is essential to determine relative priorities and specific product/market opportunities. A segmentation of the teletext and videotext markets can be performed using a variety of parameters. The parameters used in this analysis were:

- the basic nature of the product (public service or earned income),
- end users (residential, institutional or business) and
- time (near term-now, longer term - 3 to 5 years, and long term-5 to 10 years).

For each market segment*, roles and services - along with their advantages and disadvantages - were examined. The following recommendations concern specific roles, services and market segments toward which attention should be directed. Additional recommendations for opportunities which may exist as the eletronic publishing market develops are also included. The general message of these recommendations is that these markets are extremely immature and that, therefore, successful entry assumes the identification of specific opportunities and an attitude of skepticism.

Recommendations:

Near Term (Now).

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*See Exhibits VI-2 and VI-3.

Recommendations:

Near Term (Now).

1. Pursue public service applications for institutional markets. Potential opportunities exist in the institutional market for closed user group (CUG) VBI applications. Examples could include a "Weekly Reader" magazine directed toward school systems, or a military news magazine for distribution to military bases. Closed user group applications avoid the problem of decoder penetration in the residential market and offer the best prospects for initial financing. Opportunities also exist for public access systems using government information, including tourism and employment information. These systems offer the same advantages in terms of decoder penetration and funding.

   Federal and state governments and educational institutions should be the primary targets of these efforts. In particular, specific departments within the federal and state governments and state colleges should be targeted. In implementing this recommendation public television should:

   o Solicit proposals from stations and groups of stations for regional and state level applications.

   o Pursue federal applications at the national level (coordinating body mentioned above).

   o Require that a market assessment, funding and business plan be developed before entering any venture.

   o Encourage a consortium approach in which public television and the institution are "venture partners".

2. Pursue earned income applications in the private sector.

   o Appoint a coordinating body charged with Request for Proposal development, identification and contact of target bidders or venture partners, proposal review and analysis, and venture negotiation.

   o Solicit proposals from the corporate community for business applications of the VBI.

- View the applications as possibilities for joint ventures with public television as transmitter or as lessor of the VBI.
- Perform a thorough analysis of the value of the VBI in specific business applications. Public television should be prepared to negotiate venture terms on the basis of that value. Further, public television must analyze the financial viability of each potential venture.

3. Delay any national, regional, or local public service offerings to the residential market. Decoder availability and penetration remain as real obstacles to the development of the residential markets for VBI teletext. Public television is best qualified to offer specialized or targeted add-on services to the residential market, when it develops. It is not qualified to take the risk that development may never materialize or may be seriously delayed. As such public television should:

- Monitor the decoder situation over the next year to eighteen months.
- Allow the networks to work out system "bugs" and build public awareness.
- Monitor the development of the residential market over the next three years.

Longer Term (3-5 years).

Should a residential market for VBI teletext develop:

1. Seek out joint ventures or consortiums for a residential service. If at this point public television or individual stations determine that entry into residential markets is appropriate, the pros and cons of entering that market against continuing to pursue the business and institutional activities discussed above must be weighed. Moreover, public television must determine the form of service it will offer to the residential market. (The programming issue will not be discussed in detail here; however, we believe that any offering in terms of a service, should be targeted, specialized and use existing network or station strengths). A market test should explore the viability of each option.

Public television should approach this market with joint ventures or, consortia. It is particularly important for earned income ventures that partners have significant financial, managerial and marketing resources, and related industry experience.

2. Monitor opportunities for full channel participation. Some stations already have access to cable systems. Additional opportunities may evolve with regulatory changes and increased cable penetration.

Long Term (5-10 years).

If mass market appeal is generated:

1. Plan for role as public service information provider. If teletext and videotext become significant means by which the general public receives its information, public broadcasting is the most likely organization to assist in the provision of public service information.
2. Examine potential opportunities in full channel teletext and eventually, residential videotext. Government and institutional contacts may be potential sources of systems funding and information for these markets.

D. Implementing the Recommendations.

Public television can be characterized as a diverse group of independent stations or licensees created to provide high-quality, alternative programming to the television viewing public. Beyond this, the range of interests and motivations within public television is considerable. Interests and motivations vary on a regional basis, by licensee type (e.g., local authority, university, state, etc.), between large and small stations and often, between national entities and individual stations. Because of these real differences, and the perception of these differences, institutional change within public television is inherently difficult. All factors which affect the decision processes of each public television entity could not possibly be considered in a general implementation strategy.

With these caveats in mind, the general guidelines for implementing our recommendations were structured around two questions:

o How should public television (stations) approach ventures in general?

- How should public television (stations) approach this marketplace?

Approach to Ventures. Public television's approach to ventures should involve three steps:

1. Creation of a venture group. The specific functions of the venture group have been discussed previously. However, issues concerning the location of the group within the public television organization and potential conflicts in roles remain unresolved. Possible locations for such a group include:

   - General public broadcasting bodies - CPB, PBS.
   - A station consortium.
   - An independent entity.

   Our instinct is that PBS is probably the most appropriate and simplist of these alternatives to use.

   A venture analysis group would have two basic roles:

   - venture initiation
   - venture analysis

   Although it is possible to perceive conflicts between these roles, it is our judgment that the advisory nature of the group renders such conflict largely theoretical. Stations will have ultimate control over their resources, with the venture group providing business expertise and alternative opportunities for the use of public television resources.

2. Strengthening of public television's institutional fabric. To participate in venture activity successfully, public television must augment its capabilities in six specific areas. These areas are:

   - Focus, which consists of the organization's ability to devote time and resources to the analysis of new venture opportunities both from the standpoint of organizational capabilities and from the standpoint of the market. Focus often requires the organization, or responsible individuals within the organization, to step back from day to day business activities or from traditional service areas and identify and define its resources in general terms, answering the question "What do we bring to a venture?" The organization must also determine the capacity of its systems to support the venture, its motivations for venture activity and finally, its opportunities as constrained by resource considerations.

- Planning, which consists of a thorough analysis of available options, a clear decision point and the development of business plans and financial projections. The planning process will also assist in recognizing the need for coventures, if that need exists.

- Entreprenuership, which consists of the ability to seek out opportunities rather than to react to opportunities which may or may not come along. Entreprenuership further extends to the ability to take appropriate risks and finally the ability to manage the venture once it is in place.

- Business Skills which are required for venture activity include: planning; budgeting and financial control; the ability to define, package and market the product or service; and the ability to manage the operation on a day-to-day basis. Depending on the nature of participation in the venture, the specific skills required will vary.

- Clarity of Objective. The objectives or goals of a venture should be clearly stated and reconciled with the mission of the organization. If the objective of the venture is earned income, not-for-profits should not be tempted to mix this objective with traditional service objectives.

- Funding. Adequate financial resources or the ability to obtain those resources is an essential part of any venture.

We recommend that CPB or PBS initiate system development in these areas by the development of institutional seminars conducted to discuss a general venture orientation and specific aspects of institutional development. For example, an early seminar on joint venture issues and management would be appropriate.

3. Recognition of joint venture considerations. Evaluating potential joint venture opportunities and partners requires a structured approach. Virtually all joint ventures involve six distinct steps (concept, plan, agreement, staffing, control systems, entry and evaluation) which must be thoroughly assessed and understood before a venture start-up should be undertaken. The staffing of a venture group should include entreprenuerial business experience and joint venture expertise.

Approach to the Marketplace. Public television's approach to this market will inevitably begin at the station level. The interests of the individual stations and their constituents should not, however, preclude the capacity of public television to act collectively. The overall approach to the market should focus on two points:

(1) Is there a specific public or private teletext/videotext application which provides a station with a clear comparative advantage?

(2) If not, the station's VBI would probably be used to greatest advantage as a general resource and as part of a network.

Both of these points should, in turn, focus on the market and financial feasibility of the application and should recognize the trade-off involved in indefinitely committing the VBI to particular uses.

III. MARKET OVERVIEW

A. Our overall view regarding the near-term viability of these markets is a skeptical one. Several technical and market related problems must be resolved before a positive determination of market potential can be made. The following section presents our general conclusions regarding the teletext, videotext and VBI markets. Consumer awareness, demand, consumer equipment, key players, structure, timing, services and general opportunities and obstacles are all considered.

B. Teletext: Both technical and market factors increase the riskiness of teletext ventures. Despite this risk, specific teletext services that offer unique or necessary programming may still merit pursuit.

1. Awareness. Consumer awareness is low. Initial awareness will be built over the next two years by the broadcasting networks. Mass market awareness will be hampered by the lack of consumer equipment. Institutional awareness is also low.

2. Demand. It is possible that a true demand for residential teletext services will not develop unless a unique product is found. If a unique product is not found, services would merely be ancillary to regular programming, and the choice of a teletext service will depend primarily on the station depended upon for regular programming. The lack of subscription fees for broadcast teletext services is an important advantage for increasing the rate of consumer acceptance. Targeted magazine content and marketing will be key if a true market for teletext services is to develop.

3. Consumer Equipment. Decoder price and availability will continue to be a problem because equipment manufacturers are reluctant to speculate on an unproven market. Decoders now cost $600 to $1,200 and probably will not drop in price unless they are built into televisions. But if the decoder problem is resolved by building decoders into television sets -- without the alternative of inexpensive, stand-alone decoders -- development of the teletext market will be delayed. The replacement rate of consumer televisions is not likely to be affected by the availability of teletext services. The decoder situation should be resolved in the 1984-1986 timeframe.

4. Key Players. National systems will be dominated by the broadcasting networks and major cable operators. The local component is expected to be an essential part of the national systems and will be provided by local affiliates and newspapers.

5. Structure. The structure of the residential teletext market will depend on the extent of market development. The most likely structure - if development occurs - will be two or three national, general interest, multiple magazine services provided by the broadcasting networks. Multiple cable offerings will probably also exist. Distribution and the local information component will be provided primarily by the affiliates, although independent stations and outside sources of information may be used to a limited extent. Well-targeted local systems should also exist. These systems could be provided by cable operators and independent televisions stations, perhaps in conjunction with local newspapers.

6. Timing. The broadcast viewer's selection of a teletext service will depend primarily on the station depended upon for regular programming if unique teletext products are not found. Because of this, magazine content and compatibility with network standards are more important than early market entrance for new services. Targeted marketing will also be important. Delaying entry will allow participants to avoid many of the risks and market development costs currently associated with this market.

7. Services. News, weather, sports, general financial information, games and entertainment are the primary offerings of most current teletext services. As the market develops, magazine content will become more specialized and program enhancements more common. New services may be developed to provide highly specialized magazines to targeted audiences. Educational services are limited by restricted page capacity and by the lack of interactivity. Most current educational offerings are in the form of drills.

8. Opportunites and Obstacles. If demand develops, teletext presents an opportunity to generate revenues - mainly through advertising - and an opportunity to enhance current public service activities - if funding can be found. Targeted offerings are limited at this time and may represent a significant opportunity if the market develops. If teletext is viewed broadly as a method of data transmission many more near-term opportunities exist in the business and institutional markets. The greatest obstacles to potential entrants in this market is the lack of consumer awareness and demand coupled with, and partially caused by, the

lack of consumer equipment. High investment requirements for sophisticated systems, the lack of a new and unique product to stimulate demand and the uncertainty and long lag time associated with returns are also major obstacles.

C. Videotext: The following points support our belief that videotext does not, at this time, present a generally available, near-term opportunity for public television.

1. Awareness. Consumer awareness is generally low, although most personal computer owners are aware of current text-only services. Widespread awareness will develop more slowly than teletext due to higher consumer costs and because videotext is not available to the general television audience.

2. Demand. Demand for videotext will develop slowly. This will remain an up-scale market - at least for the near future - because of subscription fees and high usage and consumer equipment costs. Personal computer owners represent the most likely group of potential "early adaptors."

3. Consumer Equipment. Personal computers are the most logical choice of consumer equipment; therefore, the development of NAPLPS software for personal computers is critical to the development of this market. Stand-alone videotext terminals with NAPLPS compatibility are currently available, but are relatively expensive.

4. Players. Although publishers currently are in the forefront of this industry, major financial institutions and retailers will eventually be the lead players. Current text-only multiple revenue source videotext system operators are also potential lead players. Local banks, newspapers and, to a limited extent, broadcasters will provide much of the local component. With sophisticated systems available nationally, local systems will continue to exist only if they provide highly targeted services.

5. Structure. National systems will be dominated by major financial institutions and retailers. Local systems will be provided by franchising or joint ventures with national systems operators. Independent local systems may also exist to a limited extent.

6. Timing. Early market penetration by service providers will be critical if the cost to consumers of switching services is high. Marketing will be critical if switching costs are low.

7. Services. Transactions and interactivity will drive this market. The value of educational services to both the residential and institutional markets is also potentially high. Software developers, in conjunction with educational institutions, will produce most of the educational programming.

8. Opportunities and Obstacles. Opportunities exist for system operators with access to both information and transactional services that can afford to wait for returns. Information providers with a unique product will also find opportunities in videotext. As with teletext, the major obstacles in videotext are the lack of awareness and demand, the high investment requirement and the uncertainty and lag time of returns.

D. The VBI:

Viewed broadly, the VBI can be used for activities other than teletext and teletext related services. The following examines the use of the VBI for data distribution, although other potential activities may also exist.

1. Awareness. Institutional awareness is low. Initial awareness wil be developed by organizations with distribution facilities and potential uses to offer.

2. Demand. General demand for data distribution is high. VBI technology should be able to capture a portion of this demand if it can be marketed as cost effective and efficient.

3. Key Players. Current key players for VBI data distribution are Merrill Lynch and selected public television stations.

4. Timing. Early market entry may be important. Error rate and other technical issues may affect early entrants.

5. Services. The primary service will be the distribution of institutional or business information. Some data preparation services may also be provided.

b. Opportunities and Obstacles. Viewing the VBI as more than a teletext medium enhances public television's potential to generate revenues. As the geographic distribution potential increases, data distribution via the VBI will be more valuable. Lack of awareness and organizational coordination and technical problems are the major obstacles.

IV. CRITERIA FOR VENTURES IN TELETEXT AND VIDEOTEXT

A. Development and Use of Criteria.

This section of the analysis describes the development and application of general criteria for public service and earned income ventures in teletext and videotext. These criteria were developed as a result of information gathered during the situational assessment and represent the overall capabilities we believe are required to create and maintain a venture in electronic publishing. The roles of system operator (SO), information provider (IP) and transmitter (T) were examined to determine the applicability of the criteria to each of these roles. These roles are described in detail on pages IV-9 - IV-11 of Appendix I. (The role of equipment manufacturer was not considered in this analysis.) Finally, the relative strengths and limitations of the public television network and stations - as determined in the institutional analysis - were compared with the criteria. From this analysis, characteristics for public television applications in both public service and earned income ventures in teletext and videotext were developed. These characteristics were later used as guidelines to determine the opportunities in electronic publishing that currently exist for public television.

B. Public Service Applications.

The criteria for public service applications in teletext and videotext are listed in Exhibit IV-1 and Exhibit IV-2, respectively. These criteria fall under the general headings of resources, finance, management, industry experience and marketing. The criteria are essentially the same for teletext and videotext ventures; however, the specific application of the criteria and the relative strengths and limitations of public television will vary. For a simple transmitter role, the only absolute requirements are access to a transmission medium and a distribution network. Technical knowledge, equipment and access to appropriate information are also important. As an organization becomes more involved in the content and management of the system, the organizational requirements become more numerous. For an information provider, access to a transmission medium, appropriate information, organizational contacts and reputation are essential. Financial resources and marketing skills begin to increase in importance. A successful system operator will possess all of the criteria listed in Exhibits IV-1 and IV-2.

EXHIBIT IV-1: CRITERIA CHECKLIST - TELETEXT ROLES

	SO	IP	T	Public Television Network	PTV Stations
Public Service Applications					
Access to Transmission Medium	✓	✓	✓	✓	✓
Distribution Network	✓		✓	✓	N/A
People and Equipment	✓	(✓)	(✓)	Limited	Limited
Access to Appropriate Information	✓	✓	(✓)	✓	✓
Financial Resources	✓	(✓)		Limited	Limited
Fund Raising Expertise	✓			✓	✓
Financial and Control Systems	✓			Disadvantage	Varies by station
Organizational Coordination	✓			Disadvantage	N/A
Industry Expertise	✓			Limited	Varies by station
Formatting Capabilities	✓	(✓)		Limited	Varies by station
Ability to Define and Package Product	✓	(✓)		Limited	Limited
Audience	✓			✓	✓
Reputation	✓	✓		✓	✓
Contacts	✓	✓		✓	✓

Symbols:

SO - System Operator
IP - Information Provider
T - Transmitter

A checkmark represents a primary requirement for a role or an advantage for the organization.

A dashed checkmark represents a secondary requirement for a role.

EXHIBIT IV-2: CRITERIA CHECKLIST - VIDEOTEXT ROLES

	SO	IP	T	Public Television Network	PTV Stations
Public Service Applications					
Access to Transmission Medium	✓	✓	✓	No advantage	No advantage
Distribution Network	✓		✓	✓	N/A
People and Equipment	✓	✓		Very limited	Very limited
Access to Appropriate Information	✓	✓		Limited advantage	Varies by station
Financial Resources	✓	✓		Limited	Very limited
Fund Raising Expertise	✓			✓	✓
Financial and Control Systems	✓			Disadvantage	Varies by station
Organizational Coordination	✓			Disadvantage	N/A
Industry Expertise	✓			Very limited	Varies by station/limited
Formatting Capabilities	✓	✓		Very limited	Very limited
Ability to Define and Package Product	✓	✓		Very limited	Very limited
Audience	✓			No advantage	No advantage
Reputation	✓	✓		✓	✓
Contacts	✓	✓		✓	✓

1. Teletext.

a. Public Television Comparison. In public service teletext applications, the strengths of the public television system - and individual stations when applicable - are its access to an appropriate transmission medium and information, network capabilities, organizational contacts, reputation, audience and fund raising expertise. Limitations exist for the network - and in varying degrees for the stations - in applicable skills, equipment, financial resources, formatting capabilities and general industry expertise. Limitations also exist in the areas of organizational coordination and management systems.

Broadcast industry expertise is not readily transferable to teletext, and does not provide a significant comparative advantage for public television. Program production and packaging skills, especially when combined with electronic publishing experience do, however, generate credibility which may be used to provide access to specific market niches. Public television should not consider entering the teletext market based solely on a perceived technical advantage.

b. Implications. Public television has most of the fundamental resources to play a system operator role in public service VBI teletext applications. It lacks however, the financial, management and equipment resources necessary to capitalize on them. As such, general, public service teletext activities may include:

- Consortiums with government or institutional agencies. The agencies would provide funding for people, equipment, development and market testing and public service information. Public television would act as the system operator and transmitter.
- Public television as an information provider. This activity would ignore the major advantages of public television - the VBI and national distribution network.
- Public television as the transmitter of institutional information. The lack of institutional awareness and skills in teletext and videotext will, however, be a problem in this case.

A detailed discussion of specific applications in these areas will be discussed in Section VI - Teletext as a Viable Opportunity for Public Television.

2. Videotext.

a. Public Television Comparison. In public service videotext applications, the criteria for transmitters, information providers and system operators are essentially the same as public service teletext. Differences which exist are due to the fundamental differences between videotext and teletext. Transmission is by phone or two-way cable rather than broadcast; equipment is more sophisticated; financial, informational and formatting requirements are much greater; and the targeted audience is generally personal computer users or those who purchase special terminals rather than television viewers.

Public television's only real strengths in public service videotext are its reputation, contacts and fundraising expertise. Some general industry expertise also exists at a few stations. The major advantages which public television would have in teletext - the VBI, national distribution network and audience - are not, for the most part, applicable to videotext. Serious limitations exist in financial resources, available equipment, control systems and organizational coordination. In most cases no comparative advantage exists by virtue of access to a transmission medium, information or audience. Overall industry expertise is limited.

b. Implications. It is our belief that public television has no comparative advantage in videotext, except through its contacts with government and educational institutions. These contacts could possibly result in a role as an information provider for a few stations, particularly those connected with state colleges. For the most part, videotext should be considered an area for long-term study and planning. Possibilities may develop for consortiums once public broadcasting has experience in other areas of electronic publishing and once the mass market appeal of videotext is established.

C. Earned Income Applications.

Criteria for earned income ventures in teletext and videotext are listed in Exhibits IV-3 and IV-4. The requirements for information providers and transmittors in earned

EXHIBIT IV-3: CRITERIA CHECKLIST - TELETEXT ROLES

	SO	IP	T	Public Television Network	PTV Stations
Earned Income Applications:					
Access to Transmission Medium	✓	✓	✓	✓	✓
Distribution Network	✓		✓	✓	N/A
People and Equipment	✓	✓	✓	Limited	Very limited
Access to Marketable Information	✓	✓	✓	✓	✓
Financial Resources	✓	✓		Limited	Limited
Ability to Absorb Losses	✓			Disadvantage	Disadvantage
Centralized Decision Maker/Risk Taker	✓	✓		Disadvantage	Varies by station
Business Expertise	✓	✓		Limited	Varies by station
Information Systems	✓			Disadvantage	Disadvantage
Already in Home/Familiar with Market	✓			✓	✓
Industry Expertise	✓			Limited	Varies by station
Formatting Capabilities	✓	✓		Limited	Very limited
Advertising Audience	✓			Limited advantage	Limited advantage
Willingness/Ability to Compete	✓			Disadvantage	Disadvantage
Ability to Define and Package Product	✓	✓		Limited	Limited
Marketing and Business Strategy	✓			Disadvantage	Varies by station

EXHIBIT IV-4: CRITERIA CHECKLIST - VIDEOTEXT ROLES

	SO	IP	T	Public Television Network	PTV Stations
Earned Income Applications:					
Access to Transmission Medium	✓	✓	✓	No advantage	No advantage
Distribution Network	✓		✓	No advantage	N/A
People and Equipment	✓	✓	✓	Very limited	Very limited
Access to Marketable Information	✓	✓	✓	Limited advantage	Varies by station
Financial Resources	✓	✓		Limited	Limited
Ability to Absorb Losses	✓			Disadvantage	Disadvantage
Centralized Decision Maker/Risk Taker	✓	✓		Disadvantage	Varies by station
Business Expertise	✓	✓		Limited	Varies by station
Information Systems	✓			Disadvantage	Disadvantage
Already in Home/Familiar with Market	✓			No advantage	No advantage
Industry Expertise	✓			Disadvantage	Varies by station/disadvantage
Formatting Capabilities	✓	✓		Very limited	Very limited
Advertising Audience	✓			No advantage	No advantage
Willingness/Ability to Compete	✓			Disadvantage	Disadvantage
Ability to Define and Package Product	✓	✓		Very limited	Very limited
Marketing and Business Strategy	✓			Disadvantage	Disadvantage

income applications are similar to those for public service applications except for the increased emphasis on business skills and marketable information. For system operators, the need for a centralized decision maker and risk taker, the ability and willingness to compete and absorb losses, business skills and strategies, marketable information and an audience of interest to advertisers are the distinguishing criteria.

1. Teletext.

a. Public Television Comparison.

The main resources public television brings to earned income teletext ventures are the VBI, and distribution network. Access to marketable information, experience in the home and general knowledge of the teletext market also provide leverage for public television in this area. Limitations exist in most of the areas generally associated with commercial activities, including: marketing, planning and financial skills, the ability and willingness to compete and absorb losses, financial resources and the existence of a centralized decision maker and risk taker.

b. Implications. On a network basis, public television lacks too many of the basic criteria to be an independent system operator. The ownership of a limited resource - the VBI - and the potential for national distribution are, however, essential resources to any entity considering the develoment of a national teletext service or the use of the VBI in any other capacity. Potential venture partners should have the financial resources and business skills public television currently lacks. Publishers and other organizations which want to distribute data but lack a medium, may be appropriate venture partners. Other general opportunities which exist for public television in earned income applications include:

- Entrepreneurial stations may have success with well-targeted, local services to the residential market. Before considering this, however, a station should:
  - have the management, planning and marketing skills applicable to earned income ventures,

  - be able to deal with advertisers,
  - have the capital to invest -- at least $100,000-$150,000 -- and,
  - be able to wait for returns.

- Public television as an information provider. Again, this application ignores the major comparative advantages of public television.
- Public television as a transmitter. This activity uses the VBI and distribution network and limits the risk exposure of the system.
- Opportunities for individual stations as transmitters or information providers may also exist. The advantages and disadvantages of these activities for the individual stations are similar to those of the network.

2. Videotext.

Earned income opportunities in videotext do not exist for the public broadcasting network due to the lack of any significant comparative advantage. Individual stations could serve as the local component for large systems, but they would have to compete with newspapers, banks and possibly other television stations for the role. A minor role as information provider may also exist for individual stations. As with public service videotext, this area should be considered an area for long-term study and planning.

D. Guidelines for Ventures in Electronic Publishing.

As a result of the above analysis, the following guidelines for public television ventures in electronic publishing were developed:

- Public service applications should:
  - Use the VBI.
  - Take advantage of current market penetration.

  - Have identifiable funding sources.
  - Be geared toward an existing constituency.
  - Use the reputation, contacts and programming experience of public television.

- Earned income applications should:
  - Use the VBI.
  - Use the distribution network.
  - Require minimal investment and risk exposure.
  - Have the potential for generating income.

These guidelines will be used in Section VI as a framework for developing specific opportunities in public service and earned income teletext.

V. DETERMINING THE STRATEGIC POSITION OF PUBLIC TELEVISION

A. Purpose of the Analysis.

Section IV - Criteria for Ventures in Teletext and Videotext - described the qualifications for specific roles in teletext and videotext and compared those qualifications with the strengths and limitations of public television. This section considers the specific institutional factors that affect public television's ability to fund, enter and sustain ventures.

B. Framework of the Analysis

A potential and resilience evaluation technique was used as the framework for this analysis. (This framework is taken from Crum & Derkinderen: Strategic Modeling for Corporate Investment). Potential represents the organization's ability to find and to implement ventures. Resilience refers to the ability to sustain the venture in light of adverse financial conditions. Recommendations regarding institutional strengthening including a venture body, venture partners and station business skills - as described in Section II - were developed from this analysis.

C. Potential. The potential analysis is a means of identifying general opportunities facing public television and of determining whether the institutional resources (action range) required to exploit the opportunities exist.

1. Opportunities are ventures which use resources efficiently. They can be an extension of current activities or an entirely new area of activity. To be an opportunity, resources must be used efficiently (with efficiency defined as meeting or surpassing some pre-established criteria). Four general areas of opportunities have been identified for public television*:

---

* Because the purpose of this study was not to analyze and develop all potential opportunities for public television, this list is only a representation of what may actually exist.

- Growth in audience/subscription revenues. This would include improved or alternative programming targeted to new user groups.

- Use of the VBI. Possible uses for the VBI include expanded line 21 activities, teletext and data distribution. Additionally, opportunities may exist for selling or leasing the rights to the VBI.

- Satellite Distribution Network. Increased teleconferencing activity, data distribution during off hours or other unused time and other satellite distribution services offer potential opportunities to public television.

- Other opportunities. Additional opportunities may exist in facilities leasing or renting, technical consulting services to low-power television stations (PTV), or advertising.

While many of these opportunities may not be applicable to individual stations, in general, public television seems to have a substantial number of opportunities for action.

2. Action Range. These are the institutional resources which determine an organization's ability to exploit opportunities. Action range is determined by financial, technical, managerial and structural factors.

   a. Financial factors are concerned with the ability to finance and maintain a venture. For public television, five potential sources of project funding exist: cash flows from operations, grants, contingency funds, debt and venture partners.

      - Cash flows from operations are an unlikely source of new project funding, especially in light of continued federal cutbacks and already narrow operating margins.

      - Grants are limited by overall cutbacks, although there is limited potential in specific situations.

      - Contingency funds and cash reserves, while sometimes sufficient for funding new projects, are generally inappropriate for new venture financing.

- Debt is a possible funding source for individual stations not constrained by licensing agreements. The use of debt, even when allowed, is very risky and inappropriate for public television venture activity.

- Venture partners represent the only generally available funding source. By using venture partners, public television's financial exposure would be greatly reduced or eliminated. Venture partners could be used in both public service and earned income applications.

b. Technical, managerial and structural factors are examined to determine whether the appropriate skills and organizational flexibility exist for venture activity.

- The overall technical knowledge and equipment of the stations are good. Technical knowledge and equipment for teletext and videotext vary from station to station but, in general, would be classified as limited.

- Management, marketing and financial skills and systems have been satisfactory for traditional activities. But, the skills and systems required to compete in earned income ventures and the overall ability to evaluate and monitor venture opportunities are, for the most part, lacking.

- The organizational structure of public television emphasizes individual station initiative but reduces the value of public television's major resources - the VBI and national distribution network. This reduction in value is due mainly to the lack of centralized decision making and coordination. Structure also limits the flexibility of public television by increasing the time required for decision-making. Long decision-making lead times limit the ability of the public television system to react to environmental changes - a limitation which may be especially significant in competitive, volatile markets such as teletext.

- To an extent, regulation and the mission of public broadcasting also limit action range. Regulation, by limiting potential opportunities such as full channel teletext, and mission by inhibiting the station's ability to take advantage of all available opportunities, narrow the range of viable venture opportunities.

While the action range of individual stations may be strong, financial and structural factors weaken the action range of public television as a system.

3. Overall Potential. Strong opportunities and a weak action range imply moderate potential for public television. It is important to note that strong opportunities exist whether they are examined from a broad prospective, as in this analysis, or from the specific perspective of teletext. What does not exist is the organizational resources needed to take advantage of the opportunities.

C. Resilience. The second step of this institutional analysis is the determination of resilence. This part of the analysis considers the degree to which organizations can sustain ventures as problems occur. The analysis analyzes resilience through consideration of downside exposure and endurance.

1. Downside Exposure refers to the possibility that problems will arise which could lead to the failure of a venture. Downside exposure includes financial and competitive factors and is essentially a qualitative assessment of risk. With respect to downside exposure and cash flows, we identified two potential problem areas: concentration of cash flows and stability of cash flows.

   - Public television's overall cash flows are not concentrated in a traditional sense that there is a heavy reliance on one or two sources of funds. Individual stations, however, are likely to be reliant on a limited number of funding sources. Thus, while the cash flows of public television as a whole are not concentrated, the cash flows of the components of public television are concentrated. This concentration points to the need to identify alternative sources of funds, but also limits the organization's ability to deal with issues related to seeking alternatives. As more effort is spent on acquiring funds for traditional broadcasting services, less effort can be directed toward venture activity.

- Stability of cash flows is a major problem. Government appropriations on all levels are influenced by political and economic factors. Subscriber revenues have grown despite the economy, but are still subject to economic and competitive pressures. Unstable cash flows increase the need for contingency funds and more diversity of revenue sources.

- Competitive factors also increase downside exposure. For example, the VBI is presently a scarce resource. With the increased penetration of cable, Direct-To-Home Satellite Broadcasting (DBS) or Low Power Television (LPTV) the VBI will not be as scarce and its value as a resource will diminish. Competitive factors in this and other areas emphasize the need for careful planning and timely action.

2. Endurance is the ability to sustain a venture assuming problems arise. It depends on factors such as reaction to past crises, availability of emergency resources and political factors.

- Stations have demonstrated their ability to handle a crisis, mainly by reducing expenses and by increasing fund-raising activities. In the event of further, major reductions in funding, those reactions may not be sufficient. In that situation, the most likely reaction would be "back to basics." New ventures, especially those not directly related to public television's mission and those which are not self-supporting, would be the first to go.

- Resources vary between stations, with some stations apparently in control of the resources needed to sustain a troubled venture. Whether those resources would actually be used to sustain a venture, is questionable.

- Political factors also impact endurance. Public service ventures could conceivably receive emergency government funding. Earned income ventures would not be eligible for CPB funds and would be likely to receive emergency funding only if a venture partner exists.

3. Weak resistance to downside exposure and weak endurance imply weak resilience for public television ventures. Cash flow instability is the major factor leading to low resilience. New ventures which are directly related to the mission of public broadcasting would be more resilient. Other ventures should provide identifiable and stable cash flows to improve their resilience.

E. Implications of the PARE Analysis.

Public television currently lacks much of the institutional fabric necessary to support venture activities. Action range and the ability to sustain ventures represent problem areas. As such, public television's first priority should be institutional development. The recommendations included in Section II of this report are directed toward establishing the organizational infrastructure needed to support ventures. Assuming these recommendations are successfully implemented, public television would be a more attractive venture partner and would have the ability to evaluate ventures and venture partners. Working with an appropriate venture partner will improve public television action range and its ability to sustain ventures. The probability of successful ventures would, thus, greatly increased.

VI. TELETEXT AS A VIABLE OPPORTUNITY FOR PUBLIC TELEVISION

A. Basic Criteria for Viability.

As a result of the institutional assessment (see appendix 2), it was determined that a viable venture in teletext or videotext for public television should:

- Be consistent with the mission of public television.
- Be consistent with the strengths of public television.
- Have sufficient financial resources available.
- Have the potential for expanding the revenue base.

The analysis conducted in Section IV of this report has led us to eliminate videotext as a near-term opportunity for public television. Except on a very select, individual station basis, videotext ventures fail to meet all but the first of the basic criteria and thus, are not viable. As such, we will concentrate on teletext for the remainder of this report.

In teletext, the issues of consistency with mission and strengths are issues of role and service selection. These issues will be specifically dealt with later in this section. Financial issues, however, are relevant regardless of the role or service public television desires to undertake. This final analysis is, therefore, structured around the following question: Is there a teletext venture that is consistent with public television's mission and capitalizes on public television's strengths, that is also financially viable?

The institutional and situtional assessments were performed to answer two key questions regarding public television's role in teletext and videotext. These questions were:

- What are the prospects for ventures that are self supporting and enhance the mission of public television?

- What are the prospects for ventures that, by increasing public television revenues, can contribute to the mission of public television?

These questions were reformulated into two general options for participation in teletext. During this stage of the analysis, the options and their respective criteria were used to examine potential teletext roles, services and markets for public television. The two options are:

- Provide a public service which enhances specific public television missions.

- Undertake a venture which provides funds to enhance traditional public television services.

B. Option One: Provide a Public Service Which Enhances Specific Public Television Missions.

The objective of this option is to promote growth in existing sources of revenue by providing additional services. This option could be pursued at either the network or station level and CPB funding could be used.

The characteristics of teletext applications consistent with this option are the same as those listed for public service applications in Section IV.

- Use the VBI.
- Take advantage of current market penetration.
- Have identifiable funding.
- Gear toward a constituency.
- Use contacts, reputation and programming expertise.

The decision to pursue a venture is generally based on the identification of an unmet need (and a comparative advantage in meeting that need), or opportunism. Another alternative for public television would be to pursue ventures based on potential funding sources. While funding and mission considerations can not and should not be confused, the identification and evaluation of funding sources is not inappropriate for determining venture feasibility.

A suggested analytic technique for determining funding availability is the Growth Funding Matrix. While this technique is not without limitations, it does provide a structure by which the magnitude and growth of current funding sources can be compared. The Growth Funding Matrix is useful in evaluating public service venture opportunities at any level. Exhibit IV-1 displays the Growth Funding Matrix for public television in general and should be interpreted as follows:

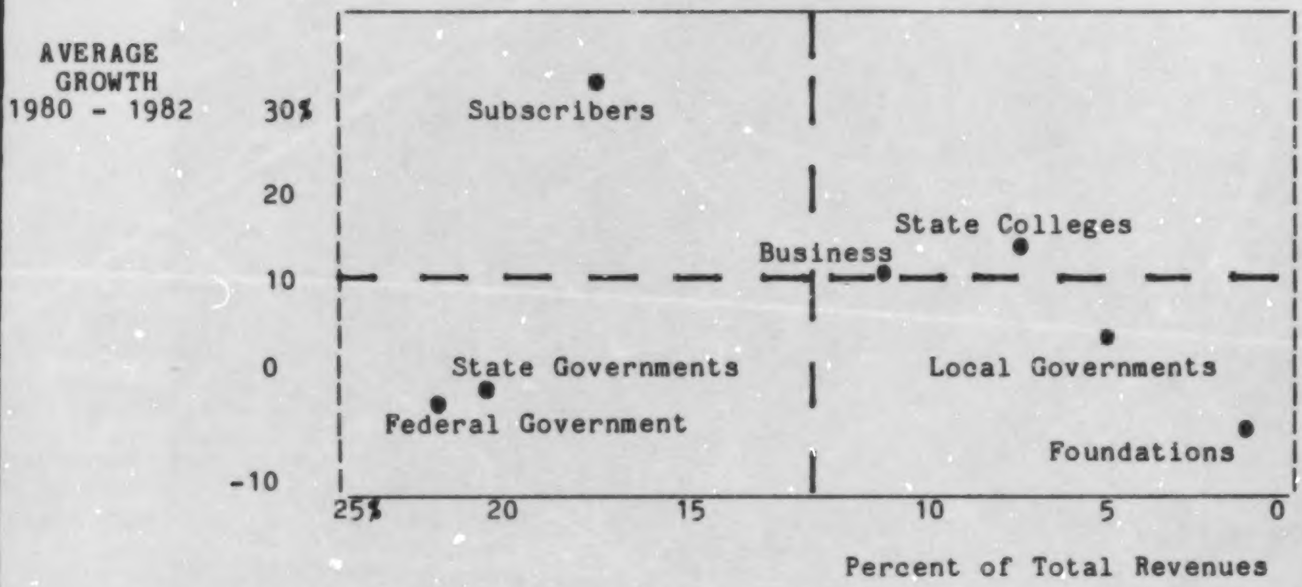
- Constituent groups in the lower left quadrant - state and federal governments - provide the largest percentage of total revenues, but are characterized by low growth. These groups may not be the best candidates for funding new public television services given their decreasing support over the last few years. Particular agencies may be viable, however, if they are marketed to provide initial funding for a service which directly benefits the agency by decreasing costs or by enhancing information distribution.

- Groups in the lower right quadrant are the most unlikely funding sources. They represent minor and unstable sources of funding for all but a few stations. Due to current economic conditions, competition for funding from these sources is very strong.

- The upper left quadrant is characterized by high growth and above average levels of funding and is occupied by only one group - subscribers. A teletext service directed at this group could be used to maintain the growth in subscriber contributions. However, this kind of service is risky because of market uncertainty, particularly, concerning the availability of decoders.

- The upper right quadrant contains groups which currently provide a small percentage of the total funding for public television and which are increasing their contributions at a relatively high rate. A teletext service directed at state colleges and businesses could enhance these funding sources.

EXHIBIT VI-1: GROWTH FUNDING MATRIX



C. Option Two: Undertake a Venture Which Provides Funds to Enhance Traditional Public Television Services.

Under this option, the venture would be viewed as a business. The objective would be earned income and CPB funds could not be used. Characteristics of teletext applications under this option are the same as those for earned income applications as developed in Section IV:

- Use the VBI.
- Use the distribution network.
- Require minimal investment and risk exposure.
- Have the potential for generating profits.

These criteria ensure that public television has something to bring the venture - the VBI, distribution network. Joint ventures should be used to minimize investment and risk exposure.

D. Development of Service Scenerios.

Scenarios were developed for providing both public and earned income services. (See Exhibit VI-2) The scenarios were developed for the residential, institutional and business markets with public television's involvement considered on a national, regional and local basis. Exhibit VI-3 explores the pros and cons of the different scenarios.

1. As an example, one public service scenario shows public television transmitting national, public service, multiple VBI magazines to the residential market. Possible subjects include children's magazines, political and/or business analysis, how-to-dos, senior citizen related material, or government and public service information. The stations could provide a local component, if they desired.

   The cost of a service of this nature would include $300,000 - $400,000 for equipment at the national level, $13,000 per station for a simple data bridge and

$75,000 - $100,000 per station to add a local component. Other costs would include overhead, marketing, product development and field trials.

Revenues for this system would have to be obtained from local and national underwriting, equipment grants, information providers and subscribers.

As Exhibit IV-3 illustrates, the disadvantages of this scenerio are considerable. They include the fact that public television would have to supply initial funding, the uncertainty of returns, the current lack of organization on a national level and, most importantly, the lack of decoders and development in the residential market.

2. A public service application in the institutional market could also be provided. Public television would act as the system operator or transmitter of a national, targeted service. A military news and information magazine is a possible example. Such a magazine could be provided via public television to military bases across the country. General news and information would be provided by the appropriate service branch and formatted in a central location. Stations near military bases would transmit the service, and possibly add a local component. Initial funding would be provided by the military, with annual fees paid to stations involved in the services.

   Applications of this type use the strengths of public broadcasting, involve little risk and are not dependent on the widespread penetration of decoders. Awareness in the institutional market is low, however, and these services would require significant marketing by public television. On the other hand, the public service institutional market is institutionally appropriate for public television and offers a potential near term opportunity.

3. In earned income applications, joint ventures with businesses are a possiblity. Transmitting data or leasing the VBI would require little management or marketing by public television, would use public television's major strengths and resources with the lowest level of risk and would not depend on decoder penetration. Disadvantages include possible opportunity costs incurred by not offering a "true" teletext service and potential liability for the content of the distributed information.

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EXHIBIT VI-2: SERVICES

Scope	OPTION ONE: PUBLIC SERVICE			OPTION TWO: EARNED INCOME		
	National	Regional	Local	National	Regional	Local
Market						
Residential	SO	SO	SO	T		SO
	. Multiple Magazine - Children's - Political Analysis - Business Analysis - How-to-Dos - Senior Citizens - Government Information . Supplement to Programming . Local component	. Geographically oriented . Occupationally oriented . Regionalized Government Information . Supplement to Programming	. Community Information . Local Events . Local Government . School Information . Supplement to Programming	. JV -- PTV as transmitter with information input	. Depends on regional strengths	. Possible stand-alone targeted Mag.
		T	T			
		. University Material	. Schools and Colleges			
Institutional	SO or T	SO or T	SO or T	SO or T	SO or T	T or L
	. Federal Government - Regional Offices - Military	. State Government . State Schools	. Local Government . Schools	. Not-for-Profits Business and Professional Organizations	. Not-for-Profits Business and Professional Organizatons	. Private Colleges
Business	N/A	N/A	N/A	T	T	
				. Joint Venture	. Joint Venture	
				L	L	L
				. Lease VBI for use in any market	. Lease VBI	. Lease VBI

SO = System Operator
T = Transmitter
L = Lessor

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EXHIBIT VI-3: PROS & CONS

Scope	OPTION ONE: PUBLIC SERVICE			OPTION TWO: EARNED INCOME		
Market	National	Regional	Local	National	Regional	Local
Residential	Pros . Uses all PTV strengths . PTV is familiar with this audience . Multiple offerings have broad appeal . Product is differentiated from general magazine . PTV has contacts with potential sources of revenue	Pros . Targeted offering . Can use university affiliations . Other contacts available	Pros . Emphasizes local service . Uses contacts . Can be combined with national service	Pros . Uses major strengths . Relieves PTV of management marketing & funding responsibilities . Allows for entrance with reduced risk . PTV shares in upside potential		Pros . PTV station has total control . Investment relatively small . Station reaps all benefits
	Cons . PTV would have to supply up-front capital . Revenues uncertain . Market is undeveloped – no decoders	Cons . Same as national, however, possibility of state funding . May be distribution problems	Cons . Same as national Unless schools or government funded . May compete with local component of other national services	Cons . Opportunity costs . Destiny tied to System Operator		Cons . Market is undeveloped . Revenues uncertain . Station would have to fund on its own . Station would have to run the business
Institutional	Pros . Uses PB strengths . Up-front funding a possibility . PTV a "natural" . Not dependent on mass market development	. Same as national	. Same as national	Pros . Uses contacts and strengths . Secondary market for teletext will develop if primary market develops . Not tied to decoder penetration	. Same as National	Pros . Not tied to decoder penetration . Minimal investment and risk . Uses reputation
	Cons . Awareness is low . Requires PB to play coordinating role if System Operator . PTV will have to market idea.			Cons . Requires heavy management and marketing . Possibility of unused capacity		Cons . Must be major institution . Opportunity cost
Business	N/A	N/A	N/A	Pros (T) . Uses major strengths & resources . Lowest risk in market . Not tied to decoder penetration . Requires little management and marketing Cons (T) . Opportunity costs Pros (L) . Little downside risk Cons (L) . Responsible for content	. Same as National	Pros (L) . Little downside risk . No management and marketing . Uses VBI Cons (L) . Responsible for content . Limited market

Development of these and other scenarios as outlined in Exhibit VI-2 and VI-3 led to the following conclusions and the recommendations outlined in Section II.

D. Conclusions.

- The institutional market currently offers the best opportunity for public service applications of teletext.
  - Participation should be through consortiums, with a non-public broadcasting entity providing initial funding. Federal and state agencies and state colleges should be targeted.
  - Awareness in this and all electronic publishing markets is low, and will have to be developed. Public television will have to "market this market."
- It is too early for public broadcasting to make a public service commitment to the residential teletext market.
  - Equipment problems inhibit decoder penetration and development of the market. This problem can be expected to persist for at least 2-3 years.
  - Market development to the point where decoders are readily available, will be gradual.
  - Timing of entry in this market is less important than compatibility with network standards and the nature of the offering.
  - If public television eventually decides to enter this market - presumably not before the 1986 to 1988 timeframe - the offerings should be multiple, targeted magazines (not a general magazine format fashioned after CBS and NBC) and program supplements.
  - National distribution with local inserts would make best use of public broadcasting resources, if a service is developed.
  - The local component or service should be designed to meet the specific needs and interests of the area and its population.

- Participation in earned income ventures should be as a joint venture partner (with funding provided by the other party) or as a lessor of the VBI.
    - The VBI can be marketed as a limited resource, with national networking a valuable addition.
    - Data transmission to the business market provides the most viable opportunity at this time.
- A coordinating body should be established for marketing the VBI and reviewing potential national and regional ventures.
- Stations should perform individual market assessments and develop funding and business plans before undertaking any venture.

Strategic Assessment (Appendicies)
# of the
Teletext and Videotext Markets
for
The Corporation for Public Broadcasting

IR 011 519

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Appendix I

Situational Assessment

I. INTRODUCTION AND METHODOLOGY

A. Introduction. The primary goals of Coopers & Lybrand's situational assessment of the market for teletext and videotext are to provide public broadcasting with an understanding of the opportunities and obstacles confronting prospective participants in this field and to establish a framework for making judgments about the nature of this market.

To accomplish these goals, this analysis:

- Presents a picture of the current teletext and videotext market by examining the major market components and their interrelationships;
- Provides a perspective on the principal market trends;
- Identifies generic industry opportunities;
- Identifies and assesses the impact of important market obstacles;
- Extrapolates from the above to form a reasonable perspective on future market developments and conditions.

B. Relationship of Situational Assessment Within Overall Planning Study. Phase I- the situational assessment establishes a foundation of teletext/videotext opportunities and obstacles which will be merged with public broadcasting's mission, strengths and limitations as identified in Phase II - the institutional assessment. The convergence of results from the situational and the institutional assessments will serve as the basis for Phase III - the formulation of general strategic directions for public broadcasting in teletext and videotext. (Exhibit I-1)

C. Phase I Efforts and Products. To develop an understanding of the teletext/videotext markets, Coopers & Lybrand conducted extensive data collection and analysis activities. Following are descriptions of the important features of our efforts and results. (Exhibit I-2)

EXHIBIT I-1

PROCEDURAL SCHEMATIC FOR THIS ENGAGEMENT

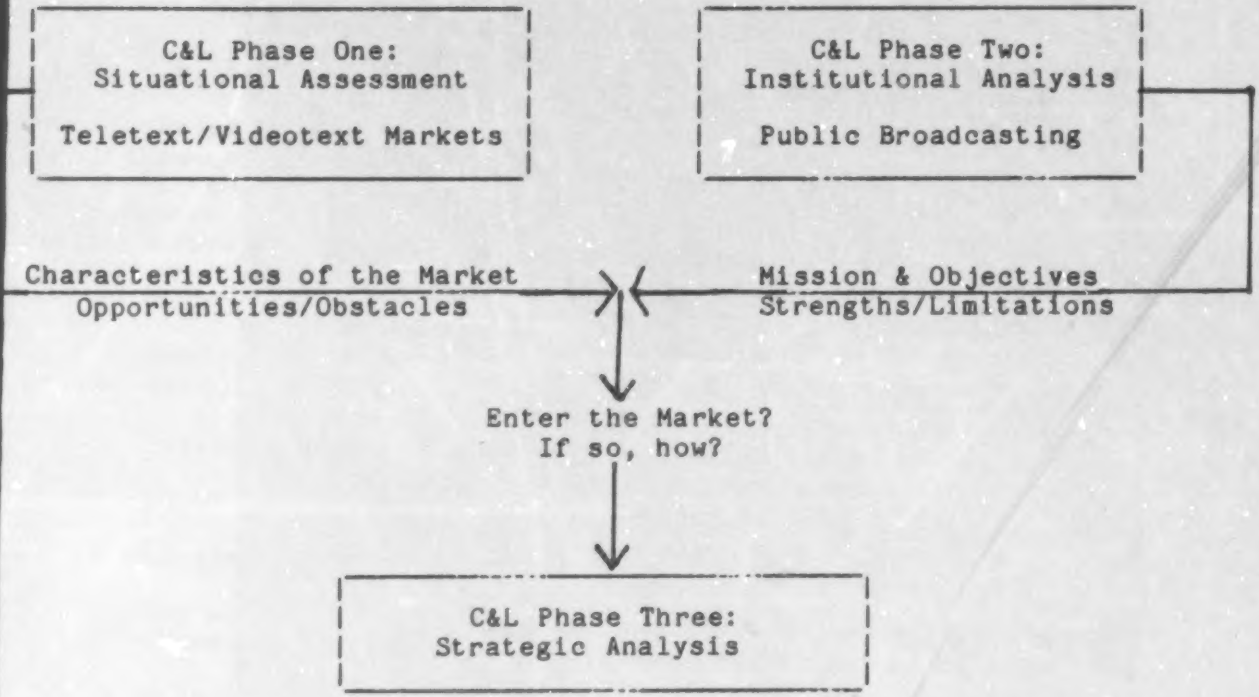
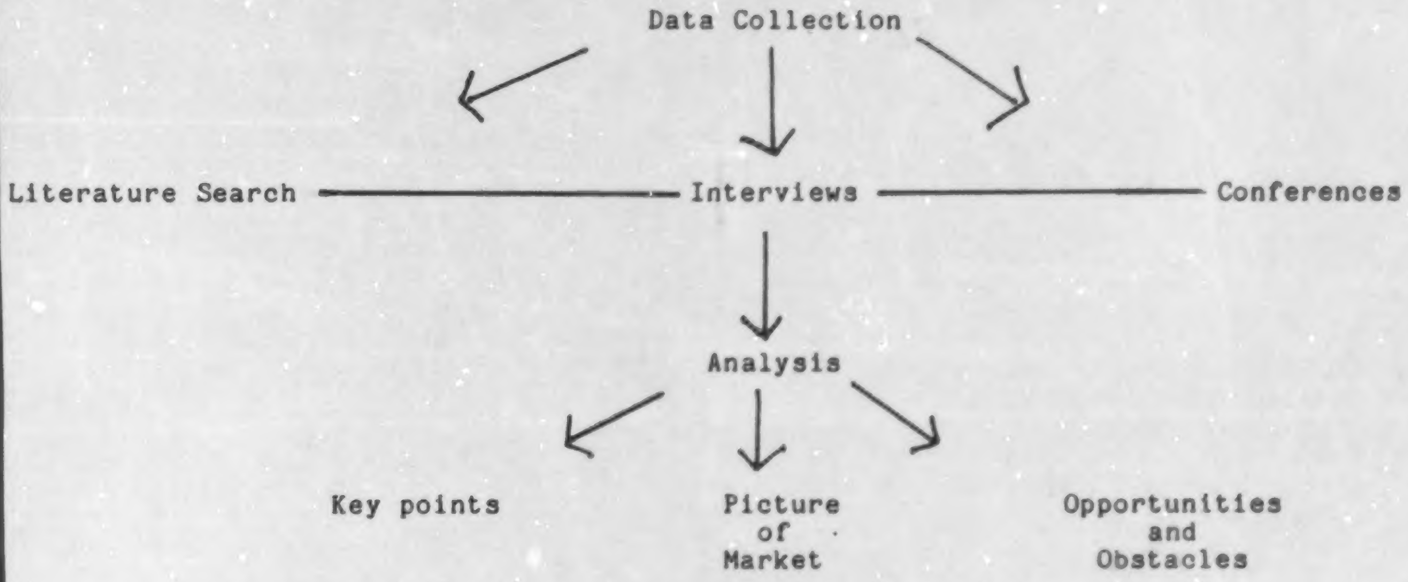


EXHIBIT I-2 SCHEMATIC OF PHASE 1 EFFORTS AND RESULTS



- Data Collection. Efforts consisted of three primary components: a literature search, interviews with key industry players and attendance at two teletext/videotext conferences.

- Literature search. The primary sources of documentation were libraries, federal agencies, industry trade associations and teletext/videotext participants themselves.

- Interviews. As Exhibit I-3 illustrates, Coopers & Lybrand's project team conducted interviews with representatives of numerous organizations involved in teletext and/or videotext.

- Conferences. Coopers & Lybrand project team members attended two conferences: the CPB forum on teletext and videotext and the Videographic Systems of America (VSA) teletext seminar for network affiliates. These meetings provided interesting contrasts between the electronic publishing activities and capabilities of the commercial networks versus those of public broadcasting.

- Analysis. Integration of the information and insights gained during the data collection process produced three interrelated yet discrete analytic products: key points, picture of the market and opportunities and obstacles.

  - Key points. Coopers & Lybrand's principal findings about the teletext and videotext markets are presented in the next section. The details and implications of the key points are discussed througnout the text.

  - Picture of the market. The body of this report is devoted to developing a comprehensive picture of the marketplace as it exists today and as it may evolve in the future.

  - Opportunities and obstacles. The situational assessment concludes with an evaluation of the current and potential opportunities and obstacles in teletext and videotext.

EXHIBIT I-3 - INTERVIEWS WITH INDUSTRY PARTICIPANTS

Advertiser Tribune - Tiffin Ohio
American Medical Association
American Newspaper Publishers Association
A.H. Belo Corp.
Canadian Broadcasting Corporation
Canadian Department of Telecommunications
Columbia Broadcasting System (CBS)
Corporation for Public Broadcasting (CPB)
Cox Cable Communications
Chemical Bank
CompuServe
Continental Telephone
Copley Videotext
Digital Equipment Corporation
Dow Jones and Company
Electronic Media Rating Council
Electronic Industries Association
Electronic Text Center
Federal Communications Commission
Federal Register
Field Enterprises
GTE Telenet
Government Printing Office
Homserve
Honeywell
KBIN
KCET
Keycom Electronic Publishing
KFME
KMTF
Knight-Ridder Newspapers Inc. (Viewdata Corp.)
KOZK
KPBS
KUON
KWCM
Logica, Inc.
Micro-TV
National Association of Public Television Stations
National Broadcasting Co. (NBC)
National Cable Television Association
National Captioning Institute
National Public Radio
National Telecommunications and Information Agency
Norpak
Northern Telecom
Oak Communications
Official Airline Guide
Online Computer Library Center
Ontario Educational Communications Authority
Prestel
Public Broadcasting Service (PBS)
Radio Shack
Reuters
Rogers Cable
Sears Roebuck & Company
Source Telecomputing Corporation
Southern Satellite Systems
Telidon
Ticketron
Time Video Group
Times Mirror Company (Videotext America)
United Press International
United States Department of Agriculture (USDA)
Vigeographic Systems
Warner Amex
WEDU
WETA
WGBH
WHA
WILL
WNET
World Book
WOUB
WTTW
WUFT
Young & Rubicam
Zenith Radio Corporation

II. KEY POINTS

This section presents a summary of our principal findings about the teletext and videotext markets. These key points were derived from the information presented in the body of this report and represent our conclusions as a result of this analysis.

Teletext:

- Consumer awareness is low. Initial awareness will be built by the broadcasting networks over the next two years; however, mass market awareness will be inhibited by the lack of consumer equipment.
- It is possible that a true market for teletext services will not develop unless a unique product is found. Services could merely be ancillary to regular programming. In this case, viewer selection of a teletext service will depend primarily on which station is tuned to for regular programming. Lack of subscription fees will be the main advantage in attracting users.
- Magazine content along with targeted marketing will be key if a real market is to develop for teletext services.
- Decoder price and availability will continue to be a problem because equipment manufacturers are reluctant to speculate on an unproven market. The equipment problem should be resolved by 1986.
- If the decoder problem is solved by building decoders into television sets, without the alternative of standalone decoders, the development of the teletext market will be delayed. Consumers are not likely to speed up replacement of their current sets in order to receive teletext.
- National systems will be dominated by broadcasting networks. The local component is expected to be an essential part of national systems.
- Revenues will be derived primarily from advertisers.
- Targeted offerings are limited. Local services must be well targeted to survive in the long-run.

- For broadcasters, successful market entrance will depend on compatibility with network standards and content of the offering. Participants who choose to wait to enter the market will avoid many of the risks and market development costs currently associated with this market.

- The value of teletext as an instructional device is limited by the lack of page capacity and user interactivity.

Videotext:

- Consumer awareness is low. Widespread awareness will develop more slowly than teletext due to higher consumer costs and because videotext is not available to the general television audience.

- The mass market for videotext will develop slowly. Consumer equipment, subscription fees and usage costs will keep this an up-scale market for the near future. NAPLPS software for personal computers is critical to market development. Personal computers are the most logical choice of terminal and personal computer owners represent an identifiable groups of early adaptors.

- Early market penetration for service providers will be critical if the cost to consumers of switching services is high. Marketing will be critical if switching costs are low.

- Transactions and interactivity will drive the market.

- Major financial institutions and retailers will be the lead players although publishers are currently in the forefront. Local banks, newpapers and television stations will compete for roles as local components.

- The instructional value of videotext is potentially high. Software developers, in conjunction with educationl institutions, will produce the educational programming.

III. MARKET ANALYSIS

A. Introduction. This section presents an analysis of the teletext/videotext marketplace from a product perspective. It includes a discussion of the distinguishing characteristics of teletext and videotext in general as well as the generic products derived from each of these technologies. While the discussion includes sections on the state of teletext and videotext technology, the emphasis is meant to be placed on the consumer, the market and the products. Particular emphasis is placed on what the consumer ultimately sees and can do with the product as well as what is expected of the consumer when purchasing and using the product. This emphasis is intentional. It is the product, not the technology, which will ultimately drive the market.

B. The Products: Definitions, Distinctions and Market Implications.

1. Generic Products. The general terms teletext and videotext currently represent at least six generic products. Three are within the classification of teletext: line 21 teletext, selective VBI teletext (VBI) and selective full-channel teletext (full channel). Three are within the classification of videotext: text only-subscriber supported videotext, text only-multiple revenue source videotext and text and graphics videotext. The primary focus of this report is on VBI teletext and text and graphics videotext.

While the products within the general categories of teletext and videotext share many similarities, there are also significant areas of differentiation. Exhibits III-1a - f detail the characteristics of the six generic products.

EXHIBIT III-1a PRODUCT CHARACTERISTICS

Line 21

Factors Which Shape the Product		Primary Product Features	Features Which Influence the Audience		Audience Characteristics
Technical Considerations	Market Orientation		Requirements of Consumers	Nature of Information	
. Passive operations . Continuous transmission . VBI line . Extremely limited graphics (capabilities)	. Mostly community service information . Some advertising to support service, not generate profits . Possible "for-profit" applications	. No consumer control over selection . Continuous transmission . All text	. Decoder-built in or stand alone: - Moderately priced - Nationally available . High "ease of use"	. Specialized: - captioning and news for hearing impaired - agricultural data - unique applications i.e., electronic billboard	. Targeted, parallels nature of service - hearing impaired - Local agri-business community - "unique application" users

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EXHIBIT III-1b

VBI Selective Teletext

Factors Which Shape the Product		Primary Product Features	Features Which Influence the Audience		Audience Characteristics
Technical Considerations	Market Orientation		Requirements of Consumers	Nature of Information	
. Selective operations . Use of a limited number of VBI lines . Graphics potential . Transmission alterternatives: over-the air broadcast, cable, MDS etc. . Reveal function	. Operators seeking advertising revenues incorporate graphics capabilities . Operators seeking subscription income transmit over adressable media i.e., cable	. Consumer control over information selection . Limited page capacity (100-400) . Text and graphics . Semblence of interactivity via reveal function . 5-10 second response time	. TV/monitor, decoder and key pad . Decoders, especially NABTS are: - expensive - not readily available . Relatively "high ease of use" . If transmitted via cable: - cable subscription charges - teletext tier fees also possible	. General interest . Can be targeted, i.e., KCET's daytime educational programming	. Heavy media users . Somewhat more upscale and early adopter than the general public (especially if transmission is over cable) . Specialized component parallels nature of targeted information

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EXHIBIT III-1c

Full-Channel Teletext

Factors Which Shape the Product		Primary Product Features	Features Which Influence the Audience		Audience Characteristics
Technical Considerations	Market Orientation		Requirements of Consumers	Nature of Information	
. Selective operations . Use of full video channel . Extended graphics potential . Transmission via cable (Technically feasible via other broadcast media) . Telesoftware	. Operators seeking advertising revenues incorporate graphics capabilities . Operators seeking subscription income transmit over addressable media i.e., cable	. Consumer control over information selection . Thousands of pages . Degree of interactivity and computing power with telesoftware . Sophisticated grahics . Generally faster cycle time than VBI teletext.	. TV/monitor, decoder and keypad . Decoders: - not yet available - projected cost $150-250 . Relatively high "ease of use" . Cable subscription charges	. General interest	. Heavy media/information users . Upscale . Early adoptor . Cable subscribers

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EXHIBIT III-1d

Text-only/Subscriber-Supported Videotext

Factors Which Shape the Product		Primary Product Features	Features Which Influence the Audience		Audience Characteristics
Technical Considerations	Market Orientation		Requirements of Consumers	Nature of Information	
. No graphics capability . Telephone or 2-way cable based . Most personal computers can acccss services.	. Narrow market focus-exclusive dependence upon subscribers . Lack of graphics reflects basic absence of advertising	. Search and retrieve type data base system . Not particularly "user-friendly." . Electronic messaging on selected systems	. Video monitor/key pad, dedicated videotext terminal or microcomputer . Subscription fee . Communications expenses: Telephone and/or cable subscription charges	. Highly specialized: geared to professional groups	. Targeted - parallels nature of information - Health care professionals, lawyers etc. - Agribusiness people . Heavy information consumers . Upscale . Early adopters

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EXHIBIT III-1e

Text-only/Multiple-Revenue-Source Videotext

Factors Which Shape the Product		Primary Product Features	Features Which Influence the Audience		Audience Characteristics
Technical Considerations	Market Orientation		Requirements of Consumers	Nature of Information	
. Similar to text-only subscriber supported videotext . Gateways	. Operators seek to reach an expanded target market . Operators seek multiple sources of income-including data storage, services to IPs, transactions and messaging charges	. Package of data base and "value-added" services. . "Popular timesharing" - search and retrieval type data base systems . Value added services i.e., messaging special information, transactions . Limited advertising . Usually "user-friendly"	. Similar to text-only/ subscriber supported videotext . Special pay-per-use or transactions charges	. Specialized, i.e., Dow Jones . General interest for computer users i.e., CompuServe	. Targeted professionals . Personal computer users . Heavy information consumers . Upscale . Early adopter

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EXHIBIT III-1f

Text and Graphics Videotext

Factors Which Shape the Product		Primary Product Features	Features Which Influence the Audience		Audience Characteristics
Technical Considerations	Market Orientation		Requirements of Consumers	Nature of Information	
. Graphics--alpha-mosaic or alpha geometric . Telephone or 2-way cable based . Many personal computers do not have the hardware to receive these services . For personal computers that are equipped - necessary software is scarce . Non-alpha mosaic terminals are scarce and expensive	. Heavy emphasis on advertising dictates need for graphics . Broad definition of customer base and potential revenue services	. Package of "value-added" services . Emphasis on advertising, transactions, and offerings which benefit from sophisticated graphics i.e., games	. Similar to text-only multiple revenue videotext . Equipment more scarce and costly	. General interest, or . Tailored for CUG use	. Upscale . Early adopter . Heavy media/information users . 25-40 age group . For CUG applications, corporations or other institutions

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2. Factors which shape the products. Technical considerations, such as page capacity and graphics capabilities, as well as marketing considerations, such as the targeted audience and potential revenue sources, shape the fundamental nature of the teletext/videotext products.

- With one exception, the distinctions between the six generic products are due to basic differences in the underlying technology. The exception, revenue source variations for text-only videotext products, reflects a contrast in the targeted audience of service providers.

- Market orientation has a direct impact on each product. The choice of technology reflects both the type of product a system operator wants to sell and the targeted audience. As an illustration, a system operator with a heavy emphasis on advertising revenues would select a system with sophisticated graphics capabilities. The requirement for sophisticated graphics in turn limits the technological options to VBI or full channel teletext and text and graphics videotext.

3. Features which determine the audience. Product features have an individual and cumulative influence upon the pool of potential consumers. Features which are particularly relevant are those which either affect requirements imposed on the consumer or what the consumer ultimately sees. The degree to which specific features influence the market varies and is generally based on two inverse relationships.

- As requirements imposed upon consumers increase, the size of the potential target audience decreases. Relevant requirements include: consumer usage and equipment costs, and skills required for operation of the system.

- As the information or applications of the product become more specialized, the potential market narrows.

C. Teletext and Videotext: An Overview. Teletext and videotext are variations on an essentially similar product. They both provide "pages" or frames of information which a consumer can view on a video monitor. Beyond these fundamental similarities, however, teletext and videotext are functionally and technically very different.

- Functional Differences. The two products differ greatly with regard to textual capacity and the ability to perform interactive processing.

- Technical Differences. Teletext is based on video broadcast transmission; videotext is based on traditional telecommunications transmission. Although technology allows some combination of these media the transmission technologies are fundamentally different: one-way versus two-way.

1. Basic product differences. The functional and technical differences discussed above have an effect on both what is offered to and required of the consumer.

   - Nature of the Products. Essentially, teletext and videotext can provide the same types of information to the same market: information consumers. However, videotext's presentation and delivery of these services are comparatively more sophisticated and extensive and are supplemented by interactive and transactional capabilities which teletext does not possess.

   - Requirements of Consumers. Not only do functional and technical considerations influence the nature of the offering but they also impose different requirements upon the consumer. Overall, the requirements for videotext are more extensive.

     - Costs. As Exhibit III-2 reveals, a number of components contribute to the cumulative cost to the consumer. The total cost for teletext consists of only one or two of these items: consumer equipment and in some cases, a subscription fee. Cumulative videotext costs are generally higher than for teletext. In addition to the price of a terminal and a subscription fee, total videotext costs may include usage fees for communications time and pay per-use charges for information and transactions.

     - Ease of use. One of the prime advantages of teletext and videotext is that they are "user-friendly". Ease of use, however, is a relative judgement which corresponds to a consumer's comfort level with a specific product. Those familiar with microcomputers will be comfortable with teletext and videotext. Those without previous computer exposure, may find operating these new technologies, videotext in particular, complex and perhaps threatening.

EXHIBIT III-2 REPRESENTATIVE TOTAL COSTS TO CONSUMERS

Service	Decoder/ Terminal	Monthly Subscription	Communications Charges	Other Charges
Line 21	$270-300	None	None	None
VBI Teletext-Keycom(1)	Rental-$10/mo.	$10	None	Cost of Cable Subscription
VBI Teletext-CBS(2)	$250-300	None	None	None
Full-Channel Teletext(2)	$150-250	$5-15	None	Cost of Cable Subscription
Text & Graphics Videotext-Knight-Ridder	$600-900	$12	$14/mo. Average Telephone Usage	Varies by Service

(1) These costs are approximations.
(2) These costs are projections for when the system becomes operational.

2. Teletext/Videotext Products: A Need for Separate Consideration. Because the factors which determine the products, the markets and the future prospects for each industry are so profoundly different, this market analysis separately considers the primary products and, when appropriate, further subdivides the discussion into generic product categories. Following are comments on the important characteristics and generic products for teletext and videotext respectively.

a. Teletext Characteristics. The term teletext refers to a one-way transmission of information, using all or part of a standard video signal. The information is coded into the video signal in such a way that it cannot be viewed by a normal broadcast receiver: a special decoder is required. The technical considerations which distinguish the three generic teletext products - consumer control, data capacity and graphics - are described below.

o Control: Passive versus selective.

- Passive. The level of consumer control over passive teletext information is limited to selecting the broadcast channel. Within that channel there may be a choice of two sub-channels, or tracks. Passive teletext operates by transmitting a continuous stream of information over the video signal. The decoder translates the data into text, which is then displayed on the screen in a "rolling text" format. Some passive teletext decoders store a screen-full of text before displaying it in order to reduce the rolling characteristic. Although many of the skills involved in producing this product may be applicable to other teletext/videotext products, this is not generally regarded as teletext.

- Selective. Selective teletext refers to a technology by which consumers can select individual "pages" (screens) of information from the teletext transmission. A fixed amount of information is transmitted over the video signal in continuous cycles. Decoders are able to store the information from selected segments or pages of that cycle at the consumer's direction. The stored information is then displayed on the television screen until the consumer selects another page. Some decoders have a "reveal" capability which allows the stored information to be displayed in a two-step process.

- Data Capacity. The question of capacity is only relevant to selective teletext and is determined by three factors: cycle time, the portion of the video signal dedicated to teletext transmission, and the form of information on the teletext display.

  - Cycle time. Cycle time is the amount of time it takes for the total number of pages available in a teletext magazine to make a complete rotation. For example, using two lines of the VBI will allow one hundred teletext pages to cycle through in twenty-five seconds. An increase in the number of pages will cause the cycle time to increase. Longer cycle times result in a consumer waiting longer for a requested page. Consumer tolerance for waiting appears to be in the ten to twelve second range; however, many observers believe that tolerance is actually much more limited. Thus, capacity is limited by the need to limit cycle time if the number of VBI lines used is held constant.

  - Use of video signal. A normal broadcast television picture is built from a continuous stream of data broken into 525 lines. Anywhere in that continuous stream of data that teletext data is transmitted, the normal picture cannot be transmitted.

    If the system operator wishes to preserve the open broadcast video picture, then the only place to transmit teletext data is in that part of the picture that is not viewed: the Vertical Blanking Interval.

    The VBI is divided into a number of lines, most of which are already dedicated to another purpose. Under current FCC regulations only lines 14-18 and line 20 can be used for general teletext purposes. For at least the next 5 years the use of line 21 is reserved for closed captioning.

Depending upon the number of lines used and the desired response time, selective VBI teletext capacity is usually about 100-400 pages.

Full-channel teletext refers to selective teletext that is transmitted over the entire video signal. The capacity of such a system is between 3000 and 5000 pages, depending on cycle times. This additional capacity increases the flexibility of the system operator. In one instance, there are plans to transmit software which could be used with intelligent decoders to perform a number of functions.

Because this approach prohibits transmission of an open broadcast picture, at present it is generally regarded as appropriate only for cable transmission. Sometime in the future, regulatory restrictions may be dropped or relaxed and thus allow for full-channel teletext via over-the-air broadcast means or at night after sign-off.

- Information. The use of some forms of information display, particularly graphics, requires greater transmission time. As a result, the potential number of pages is decreased or the consumer waiting time is increased.

o Graphics. The graphics capabilities of any teletext system are a function of the transmission standard utilized. Technically, any level of teletext - passive or selective, VBI or full-channel - can make use of sophisticated graphics. In practice, sophisticated graphics use a substantial amount of the transmission capacity. Consequently, passive teletext rarely, if ever, employs graphics. VBI teletext can employ graphics, but as noted, at a definite reduction in capacity. Full-channel teletext has the capacity to employ extensive graphics on a regular basis.

At this point, graphics are used primarily to meet a fundamental marketing objective: the generation of advertising revenues. There is little evidence that consumers demand or even desire sophisticated graphics. On the other hand, "high quality graphic illustrations are necessary to attract advertisers." (Viewtron brochure). This belief is held widely but not universally throughout the industry. Keycom, for example, is not in total agreement. While acknowledging the general importance of graphics, they discount the need for sophistication. They believe that the alphamosaic presentation is sufficient for consumers and advertisers alike.

b. Videotext Characteristics. While the types of teletext products are readily distinguished by the nature of the technology used, the definition of videotext is more involved.

Videotext refers to the two-way transmission of information between a host computer data bank and a remote video monitor.

- Functional Qualities. Videotext incorporates the "selective" capabilities of teletext and can add a true interactive capability which allows consumers to send information to the system operator and/or conduct transactions.

- Technical Qualities. Videotext services can be delivered via numerous technologies. Transmission methods include: telephone lines, cable lines and hybrids of telephone and cable.

  The display technologies also vary and can include add-ons to existing television receivers (whether as separate or built-in components), interfaces between microcomputers and television receivers, microcomputers with specialized software, microcomputers with standard communications software, and traditional data processing terminals.

  The technical capabilities that comprise videotext technology - communications networks, computing capability, etc. - are already well established.

Videotext represents a new development in the marketing of existing technical capabilities - based primarily on value-added services in the form of prepared databases, specially designed software, and access to transactional systems.

Three principal factors offer distinctions between videotext product offerings: the presence or absence of graphics, the availability of gateways and the source of revenue generation.

- Text-Only vs. Text and Graphics. Technically, the ability to use sophisticated graphics in a videotext system is a function of the transmission standard used and the ability of the "decoder" to translate that transmission. This is essentially the same distinction that was found in teletext - a limitation of the selected system, rather than a limitation of the fundamental product. From a market perspective the presence of graphics typically indicates a focus on the residential market and advertising revenues.

- Gateways. Gateways are conduits between consumers and remote data bases via a home or central computer. Gateways technically permit access to any number of different data bases. However, because they are expensive and involve multiple systems operators they are not currently widespread.

- Multiple vs. Sole Source of Revenue. Traditional timesharing and value-added information processing networks derive their revenues from the system's users - subscribers in this context. By expanding their service offerings, the emerging "videotext" providers are taking a broader perspective as to who comprises their base of customers and how those customers pay for the various services. In addition to subscription charges, system operators can obtain revenue in the following ways: advertising, special pay per-use services, royalties, information provider (IP) services, transactions, and closed user group (CUG) fees.

D. Current State of the Markets. This section uses the product life cycle as an analytical tool to explore the details and implications of the respective products' developmental stages.

1. The Product Life Cycle: A Brief Description. The product life cycle consists of five different stages: precommercial, introduction, growth, maturity and decline. For the most part, factors associated with each stage are universally applicable to all products and markets. However, the timing associated

with the movement between stages is product-dependent and cannot be generalized.

Exhibit III-3 illustrates the rates of product evolution for various media in the U.S. and highlights the extent to which timing is individualized. The telephone, which is not shown on the chart for practical reasons, progressed very quickly through the precommercial stage. However, once introduced commercially, it took 69 years for the telephone to reach fifty percent of the households. Cable television also showed a relatively slow acceptance rate after introduction, taking 32 years to reach 29 percent of households. Television and AM radio, on the other hand, both experienced relatively long precommercial phases. However, movement through introduction to growth was very rapid. Television and AM reached 50 percent of households in eight and eleven years respectively.

An analysis of the factors which affected the acceptance rates of these products provides some insight into the future growth of teletext and videotext. Exhibit III-4 shows the key characteristics that influenced acceptance rates for telephone, television, pay TV and AM radio and their relationship to teletext and videotext. The three characteristics which affected the acceptance rate are: requirement for extensive infrastructure, charge of subscription fee, and position of product as a unique service. Both telephone and cable required an extensive infrastructure before the product could reach its market. Further, they both require some kind of monthly charge. Telephone, however, had the advantage of being a totally unique service while cable, at least in its early stages, was basically an auxiliary service to an existing media. Television and AM radio, on the other hand, had no requirement for either an extensive infrastructure or a subscription fee. In their time, they were both unique products. These comparisons point to VBI teletext as possibly achieving the earliest acceptance. The infrastructure is already in place and, apart from the purchase of the decodes, the consumer bears no cost for the service. The major hurdle to rapid acceptance is that the consumer must perceive teletext as a valuable and unique service. Full channel teletext may grow as cable television grows. The required infrastructure is, for the most part, already in place. However, this service will probably require an incremental subscription fee and, as with VBI teletext, consumers must perceive the service as valuable or unique if they are to become and remain subscribers. Videotext, by phone, already has the required

EXHIBIT III-3 GROWTH OF MEDIA IN THE U.S.

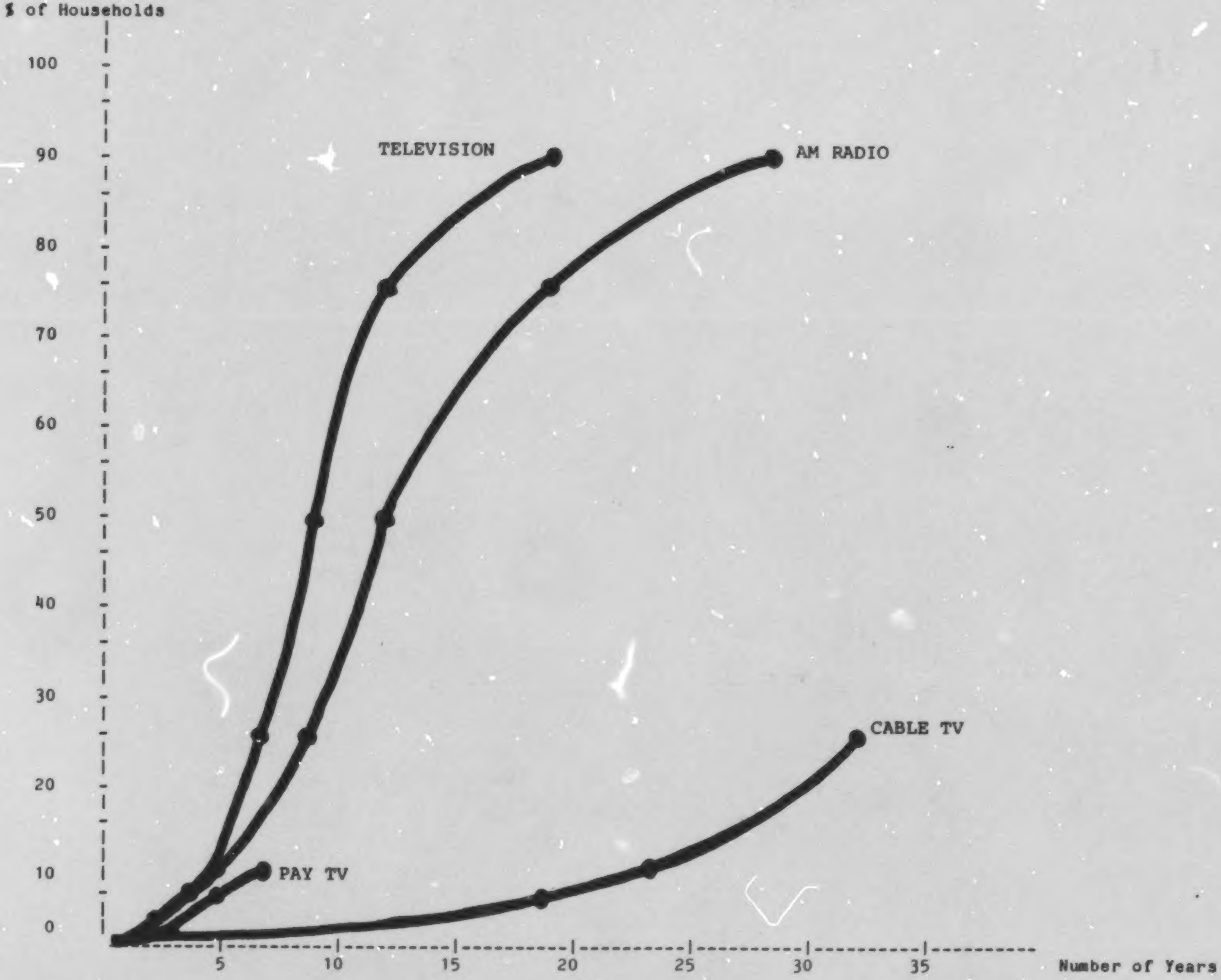


EXHIBIT III-4 GROWTH OF MEDIA IN THE UNITED STATES

KEY CHARACTERISTICS

	Slower Acceptance		Too Early to Tell		Rapid Acceptance	
	Telephone	Cable	Pay Cable	STV	TV	AM Radio
Extensive Infrastructure	Yes	Yes	Yes	No	No	No
Subscription	Yes	Yes	Yes	Yes	No	No
Auxiliary to Existing Media	No	Yes	Yes	Yes	No	No

RELATIONSHIP TO TELETEXT AND VIDEOTEXT

	Teletext		Videotext	
	VBI	Full Channel	Phone	Cable
Extensive Infrastructure	No	Cable	Phone	Cable
Subscription	No	Yes	Yes	Yes
Auxiliary to Existing Media	Yes	?	No	No

infrastructure in place. However, the cost of the terminal and the relatively high monthly fees, may inhibit the initial acceptance of the product even though the transactional capabilities of videotext systems may be viewed as unique.

2. Teletext and Videotext Products. With respect to the product life cycle, the six generic products can be classified into three separate categories. (See Exhibit III-5.)

- Category One consists of products which share the qualities of nascent, emerging markets. These products, VBI teletext, full-channel teletext, and text and graphics videotext are clustered around the pre-commercial and introduction phases.

- Category Two includes only one product - text-only/multiple-revenue source videotext. Its position on the cycle is on the border between introduction and growth.

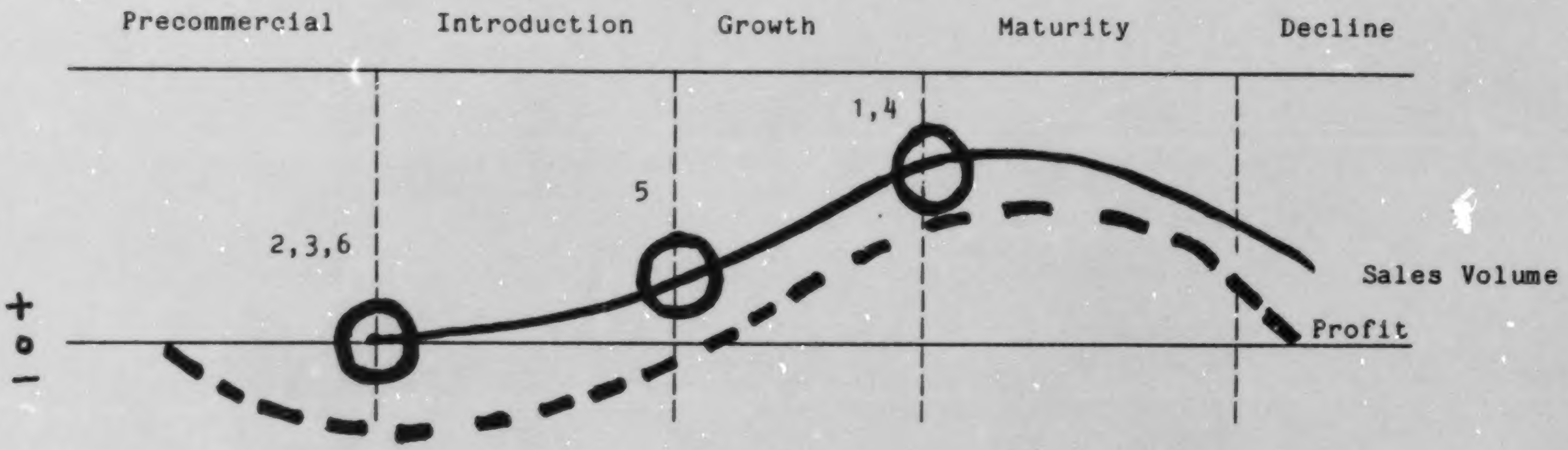
- Category Three consists of Line 21 programming and text-only/subscriber-supported videotext. These products exhibit the qualities of markets in the growth to maturity phases.

a. Category One: In contrast to being driven by consumer demand, the markets for these emerging products do not yet exist and thus will have to be created. There is currently little consumer awareness of these products and minimal perceived or recognized need for the services they can offer. Efforts to generate awareness and need for these products have been stymied by the limited availability of consumer equipment. The lack of equipment inhibits market development while equipment manufacturers have been reluctant to commit resources to produce something for a market that is not yet viable.

As noted above, the markets for these emerging products can be classified as "pre-commercial" moving towards "introduction." Reflecting the generally undeveloped state of the market, the pre-commercial stage is characterized by five primary areas of emphasis:

EXHIBIT III-5

TELETEXT/VIDEOTEXT GENERIC PRODUCTS: IN THE PRODUCT LIFE CYCLE



1 - Line 21
2 - Selective VBI teletext
3 - Full channel teletext
4 - Text-only subscriber supported videotext
5 - Text-only multiple revenue source videotext
6 - Text and graphics videotext

- Testing and refining the technologies. Efforts are directed at identifying and eliminating the technical bugs in the systems; achieving higher degrees of sophistication and cost effectiveness; striving to determine what is technically feasible and which are the optimal hardware combinations. It is important to remember here that technology is not the product; instead, organizations are trying to identify the best technical approach for providing the product.

- Designing, defining and developing the products. Uniqueness is pursued both on a general industry level and on the individual organization level. Attempts are made to establish the actual or perceived usefulness of the product for consumers.

- Generating market awareness of the product's existence, uses, and advantages. This is a critical part of market development. Major marketing efforts are sometimes required to create consumer awareness. Substantial resources are committed, not only to educate consumers, but to create a "need" within a targeted market.

- Market testing. This is usually an extensive undertaking which may include: assessing demand, identifying usage patterns, determining price sensitivities etc.

- Structuring business operations. This may involve the creation of a new corporate division or the introduction of a new product line. An infrastructure consisting of management, marketing, service, R&D, and production capabilities is established at this point.

Although the pre-commercial phase is inherently speculative, the new teletext/ videotext products seem to be especially high risk business propositions. The specific risks are due to the following:

- There is currently no clear or compelling reason to buy these products.

- Demand does not exist and will have to be created, presumably at considerable expense.

- Until demand is reasonably well established, mass production of consumer equipment will not occur. As a result, hardware may remain prohibitively expensive.

- R&D and market development costs are high. (This will be especially true with regard to NAPLPS and NABTS compatible systems.)

- The timing of progress into the "introduction" stage is highly uncertain.

The dynamics of moving from the pre-commercial to the introduction phase of the product life cycle substantially influence the nature of the product itself, the business organization and the competitive business strategy.

- The Product. Entry into introduction implies a shift from the product definition, development and design which occurs in the pre-commercial stage to emphasis on: improving the quality of the product or service, encouraging trial, and making the product widely available.

- The Business Organization. Originally established in the pre-commercial stage, the organization turns from a testing and R&D perspective to a production, marketing and distribution mode. Major efforts in this phase are directed at strengthening the organizational infrastructure and the product distribution network.

- Business Strategies. Competitive business strategies make their first strong appearance in the introduction phase.

  - The industry focuses on attracting the early adopter market while at the same time inducing trial usage and, thereby, exposure to other levels of potential consumers.

  - Promotional activities flourish and range from offering a free month's service with the purchase of a terminal to placing decoders or terminals in public places.

  - Industry players develop and implement individual strategies to begin building a base for profit and market share. This involves developing a strong distribution network and in some cases targeting and gaining control over major markets.

- Strategies frequently include a focus on resolving standards and regulatory issues which may inhibit a competitive market.

b. Category Two: Text only multiple revenue videotext is situated on the border between the introduction and growth phases of the product life cycle. These products are represented by services such as The Source, CompuServe and Dow Jones News/Retrieval. In some cases, the service providers themselves do not consider their product to be videotext. As an officer of The Source once stated, "The Source is a multi-user information system. It's not videotex." (BMC 10.1.B. p4). The market for this product category can be characterized as follows:

- The product is readily available on a national basis.
- Consumer awareness is moderate to high among the targeted market and virtually non-existent beyond this particular population.
- The targeted and actual audience consists almost exclusively of personal or microcomputer users.
- Current demand for the product is low, but it does exist and seems to be growing at a rate corresponding strongly with the rate of growth in personal computer users. The Source, for example, currently has about 34,000 subscribers and boasts a 2,500 average monthly increase.
- With respect to revenues, almost all of these operations are generating income. Relatively few, however, are profitable.
- For most of the service offerings there is substantial competition for market share. CompuServe, The Source, Dow Jones and Delphi, for example, are generally competing for the same dollars.
- The marketing infrastructure is in place. Retail outlets for personal computers are the primary distribution end point.

- System operator and consumer equipment is readily available, moderately priced and functionally appropriate.

The primary areas of emphasis for organizations providing this form of videotext are as follows:

- Refining and improving the basic product. This may involve adding new offerings to the overall package, or increasing the level of "user friendliness." Refinements will most likely include the addition of graphics in the near future.
- Heavy concentration on marketing and competitive business strategies. Organizations focus on:
  - Raising existing levels of awareness.
  - Pursuing logical new audiences, such as less sophisticated personal computer users.
  - Achieving product differentiation.
  - Encouraging brand loyalty.
- Experimentation with alternative transmission and access methods aimed at finding methods to reduce costs and expand the potential consumer pool.

c. Category Three: Although still relatively small, the markets for text-only, subscriber supported videotext and Line 21 teletext are established and the products themselves are in the growth to maturity stage of their product life cycles.

The markets for Category Three products are characterized by the following:

- Consumer awareness is high among targeted audiences.
- Demand for the product is established.

- Consumer demand is the primary driving force in the market, in contrast to markets that are supplier driven.

- The products have established market niches.

- Hardware is available on a widespread basis.

- Equipment prices are reasonable - consumer videotext terminals, for example, begin around $200.

- The marketing infrastructure is in place.

- The technology for the products has been adapted to the market's needs and is operating efficiently.

Text-only/subscriber supported videotext consists primarily of search and retrieve data base systems and is directed at highly specialized professional markets such as lawyers, doctors, and business people. Examples of offerings in this group include Lexis, Nexis, GTE Medical Information Network, and Agristar. These kinds of services have existed for many years and only recently have been classified as videotext. Analogous with the Source, some offerings in this category are not considered to be videotext by their providers. The Official Airlines Guide for example, still considers its product to be a continually updated electronic database.

Line 21 captioning for the deaf also has a solid user base. According to the National Captioning Institute (NCI), the audience for closed captioning is estimated to be more than 240,000. 70,000 decoders have been sold.

E. Current State of Technology. One of the most striking features of the current state of teletext/videotext technology is the disparity between what is technically feasible and what is actually available. This section analyzes the details and market implications of the current state of those technologies by:

- Exploring the disparity between technical sophistication and equipment availability.

- Assessing the status of technology from the system operator's perspective.
- Assessing the status of technology from the consumer's point of view.
- Looking at both the system operator and consumer equipment areas as they pertain first to teletext and then to videotext.

1. Technical Issues: An Overview. The technology used in this field is neither new nor complex. For the most part, teletext and videotext involve the application and integration of existing technical capabilities i.e., communications and microprocessing.

While the technologies for teletext and videotext are comparatively well developed, the equipment markets are not. Most of the necessary equipment is not available on a mass production basis. The scarcity of readily available, reasonably priced equipment is attributable to two factors:

- The chicken-and-egg dilemma. As detailed earlier, with negligible market demand, manufacturers have been reluctant and/or unwilling to commit resources to this industry. Due to limited production, costs are high and thereby inhibit demand.
- Lack of transmission standards. Transmission standards have not been adopted for either of the two markets. System-equipment vendors and decoder manufacturers have to take a significant risk if they are to begin production of equipment or decoders that are based on a specific transmission standard. In the absence of government action to establish standards, the manufacturing of hardware becomes a gamble that most vendors are unwilling to take.

a. Types of Standards. The alternative data transmission standards can be divided into five basic groups:

- Text-only: Usually uses a monochrome display, and has no graphics capabilities. These transmission standards have typically been used for applications such as traditional data processing (DP)-based telecommunications, timesharing, DP networks (all using standard DP terminals), and for passive teletext.

- Alphamosaic: Divides the display into small blocks which can be colored and constructed to produce rough graphics.

- Alphageometric: Produces a much finer resolution than alphamosaic. Graphics are constructed through the definition of geometric shapes (circles, arcs, rectangles, polygons, lines, points, etc.), rather than a construction of small blocks.

- "North American" Standard: Comprised of North American Broadcast Teletext Standards (NABTS) for teletext and North American Presentation Level Protocol Standards (NAPLPS) for videotext, this standard is essentially an alpha geometric standard that allows for the construction of alphamosaic graphics if desired.

- Alphaphotograhic: Still in the developmental stages, this standard would incorporate all of the standards listed above, but it would also allow segments of the display screen to achieve a near-photographic quality. This degree of graphic resolution carries a high cost in terms of data requirements: for teletext this would substantially reduce overall capacity; for videotext this would require lengthy transmission times.

b. Prospects for Increased Equipment Availability. Three factors may induce greater equipment availability.

- To minimize their risks, vendors of teletext and videotext equipment, non-U.S. concerns in particular, are extremely active in trying to build markets for their own products before commencing production. Success to date, however, has been limited.

- A trend in the U.S. towards the "North American" data transmission standards seems to be developing. A number of very large participants in the emerging United States teletext and videotext industries have adopted the NABTS/NAPLPS standards. In Canada, while the alphageometric standard prevails, the standard was modified to encompass NABTS/NAPLPS.

- As the teletext/videotext industry's potential becomes increasingly viable, a number of manufacturers i.e., Zenith, Matsushita and Sony have decided to enter this market. Mass production of sophisticated, reasonably priced equipment is expected to begin in the near future. One and a half to two years is the most frequently cited time frame- although this may prove optimistic. Further, videotext appears to be ahead of teletext in terms of equipment availability.

2. Teletext Technology: Hardware and Costs.

a. System Operator equipment. Because of the specialized, video-signal nature of teletext, the systems operator equipment must be built specifically for teletext operations. Equipment for producing and receiving teletext (suitable for use on United States television receivers) is available only on a limited, or pre-production basis. Most current experiments and ventures are using hardware that is a hybrid of equipment from a number of sources, frequently combined through the special technical talents of the system operator.

- Levels of Sophistication. There are different levels of sophistication that a systems operator can adopt in setting up a teletext operation.
    - A small system operator can be expected to generate and broadcast one complete set of pages (referred to as a magazine), and might wish to have the capability to pass through a teletext feed from another source -- such as a nationally-based network.
    - The large system operator can be expected to produce, store and transmit a number of different teletext magazines. These magazines may be very specialized and may be used to "feed" other stations on a network or syndicate basis.
- Equipment components. The basic system operator equipment includes hardware and software specifically developed for page creation, page storage, page management, generation of the cycled teletext signal, reception of teletext signals from other sources (network or syndicated programming), combination of generated and received teletext, and insertion of the teletext signal into the broadcast video signal.

A larger-system would include hardware and software suitable for handling extensive page storage, sophisticated page management, and a method for distributing teletext signals to other, smaller-system operators. Normal network communications hardware appears to be appropriate for such distribution channels. Many network feeds possess a larger bandwidth than needed for the video signal, and that additional bandwidth can be used to transmit multiple magazines. Satellite transmission appears to be especially well-suited to this process, since it makes a very wide bandwidth available -- thereby increasing the number of different magazines that can be transmitted simultaneously.

o Costs. The cost of teletext operator's equipment varies based upon the sophistication of the service being offered and upon the degree of involvement in the system. The geographic range of the services should also affect the total cost of equipment although this relationship is marketing and economically oriented, rather than technically oriented.

For a full-channel national teletext system, the total system equipment investment could be millions of dollars. Computers ($70,000 to $250,000 each), frame creation equipment ($30,000 to $50,000 each) and extensive software development are the principal expenses. In addition, some of the equipment required for full-channel origination is currently not available and will require development and the associated expense.

A national, VBI teletext operator would require a very sophisticated page management system ($200,000+) multiplexors, diffusers and multiple frame creators ($30,000 to $50,000 each). Again, the investment in equipment, including development, could reach or exceed one million dollars.

Local, independent teletext system operators would normally not require the most sophisticated page management system or as many page creators as a national operator. A relatively sophisticated page management system, multiplexor, diffusor and one frame creator could be purchased for $175,000. Additional frame creators could push the cost as high as $300,000.

Local component providers for national systems avoid most of the software development and equipment costs. A simple page creator and storage device, multiplexor, diffuser and data bridge can be purchased for between $50,000 and $100,000.

The lowest level of involvement in a teletext system will be a retransmitter for the national feed. A "smart" databridge, which would allow the local station to retransmit the teletext information, regardless of the program being aired, would cost between $8,000 and $15,000 depending on the manufacturer. A "dumb" databridge can be obtained for as little as $5,000.

b. Teletext Decoders. As with system operator equipment, teletext decoders must be built specifically for teletext operation. This equipment is available for receiving teletext (in the United States) only on a limited, or pre-production basis. Most current experiments and ventures are using a small number of specially-built decoders, or modified decoders intended for foreign markets.

- Components. Decoder equipment includes hardware and software specifically developed for signal reception (tuner), data identification and reception, memory, data translation/graphics generation (processor), and transmission to the television receiver. The decoder also needs to include a page selection device. Usually this device is very similar to remote control units, with the addition of certain special function keys.

- Impact of technical limitations. The following two technical limitations detract from the flexibility and ease of use of teletext.

  - RGB connection requirements. Most of the teletext decoders that are either available now, or are in planning stages, require a special RGB connection to the television set. This is not the simple "plug-in" RF modulator most video games use, but an extensive set of cabling that cannot be "added" to an existing set without modification.

- Technical incompatibilities between teletext and videotext. In theory, the graphics production capabilities of a teletext decoder could be applied to videotext applications (thereby enabling consumers to use the same equipment for both products), but the technology currently available does not permit this dual use. It is entirely conceivable that software-driven products (such as standard microcomputers) could be set up to handle both teletext and videotext. Recognize, however, that the data reception hook-up (from the consumer's perspective) will continue to differ for the two technologies regardless of the sophistication of decoders. Video-signal reception will be required for teletext, and a telecommunications connection will be required for videotext.

o Prospective developments. If they materialize within a reasonable time frame, the following technical developments could be major market catalysts.

- Built-in decoders. Teletext decoders may eventually be reduced to little more than a microchip, and will be built into television receivers. In this case, teletext would be operated from the receiver's remote control unit, and no special preparation on the consumers part would be required. Both USA and Norpak are anticipating production of decoder boards for this purpose in the 1984-1985 timeframe. While this will be a catalyst for teletext in time, unless standalone decoders are also available at a reasonable price, initial market development may actually be impeded.

- Enhanced memory. Another possibility is a teletext decoder with extensive internal memory, that would be able to store many pages of information. If the selected pages are already stored, the decoder can respond to viewer page selections with greater speed.

o Costs. Decoder costs are decreasing, but at present are still quite high. Keyfax teletext decoders built by Chrystallate Holdings PLC, a British corporation, are $325. 1984 projections for Panasonic's Time Video Group decoder range from $150-$250. $275 is VSA's 1984 projection for built-in circuit boards for orders of over 10,000. A single VSA decoder is expected to cost $560. The estimated price of Norpak's decoder with RF is $2,000. According to some industry observers "ideally, decoders will cost about $50 or less and will eventually be built into the TV set". (BMC 1.1.2 p1.) The current state of the market is far from "ideal".

3. Videotext Technology: Hardware & Cost.

a. System Operation Equipment. Videotext involves fairly standard database and telecommunications technologies. Most videotext system operator equipment involves the implementation of special videotext software (for the consumer-interface) on normal mainframe and/or minicomputer hardware. While the equipment is readily available, the software for mass-market videotext is generally proprietary and was developed over considerable time with a substantial investment of resources.

o Software.

Availability. The limited amount of available videotext software is based primarily on alphamosaic standards, or has been designed for disseminating information internally within corporate organizations.

Difficulties. Many of the ventures have had considerable difficulty in developing software that is both easy for consumers to use and at the same time efficient from a data processing/data management perspective.

Applications. System operator software is specifically developed for page creation, page storage, page management, and telecommunications.

o Hardware.

Components. Required hardware includes: significant computer capabilities, with substantial storage, and the ability to handle numerous simultaneous users; and sophisticated telecommunications capabilities, possibly including access to advanced telecommunications networks. As additional users are given access to the videotext system, the system operator must acquire additional telephone lines, modems, multiplexors, and CPU ports for communications. Also, as the number of users increases to a point of seriously burdening the computer's processing capabilities, the system operator will need to add CPU memory in order to handle the increased work load.

- Costs. The cost of videotext equipment varies based on the number of users and, to a less consistent but more drastic extent, on the amount of information available.

  Computer capabilities account for the bulk of equipment expenditures. Although a $10,000 personal computer could be used in a very limited system, a large system will probably require more than one $1 million mainframe. Software development can as much as double computer hardware costs.

  Requirements for telecommunications equipment, such as telephone lines, modems and concentrators, increase in a step-like function with growth in usership. For each 10 to 50 new users an additional modem ($500 each in large quantities) and telephone line will be required. For each 25 modems, or 250 to 1250 users, an additional concentrator ($10,000 each) will be required.

  Frame creation terminals, like those used for teletext, currently cost $30,000 to $50,000. The number of frame creation terminals required will depend less on the total number of available frames than on the number of frames continually up-dated.

b. Videotext terminals. Because of the standardized, data-communications nature of videotext, videotext terminals may be comprised of a wide range of hardware and software configurations. Many of these configurations are based on readily available equipment, such as microcomputers. Specially-built videotext terminals, designed for text and graphics applications and produced at prices suitable for mass-market sale, are available only on a limited, or pre-production basis. Most current videotext experiments and ventures are using specially-built terminals, or microcomputers.*

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* American Bell has just announced the availability of its new Sceptre terminal. The terminal will be priced at $900. It will be available for $600 in South Florida for the introduction of Knight-Ridder's Viewtron Service.

- Components. Terminal equipment includes hardware and software for telecommunications (modem), data translation/graphics generation (processor), data storage if applicable, and display of information. The display function can be handled through a DP terminal, or it can be handled by generating and transmitting a video signal to a television receiver. The terminal also needs to include a device with which the consumer may interact with the host computer. When the terminal is based on a microcomputer or DP terminal, this function is generally performed on the keyboard; when the terminal is based on specially-built equipment, this function is frequently performed on a numeric keypad that is very similar to the keypad of a touch-tone telephone.

- Impact of technical limitations. The most critical technical limitations of videotext terminals are associated with transmission.

    - Telephone-based videotext. Most of the videotext systems that are available now, or in planning stages, require that commumications be performed over telephone lines. This means that virtually all videotext services require the consumer to tie up a telephone line while using the service. The consumer's telephone cannot be used for any other purpose while the service is being accessed, and the service cannot be accessed over party lines. (The new American Bell Sceptre terminal does, however, include a "call-waiting" feature which partially alleviates this problem.) Furthermore, expected post-divestiture rates for local calls could make using videotext very expensive.

    - Cable-based videotext. Cable-based videotext systems have a different set of limitations. Current cable technology is not adequate for the extensive two-way communications that videotext requires. Hybrid systems--using a teletext variant over a video signal, and requiring the consumer to dial-in to the system in order to perform transactions (or even to select different teletext "magazines")--have the same fundamental technical limitations as telephone based videotext systems. By combining the teletext and videotext functions, however, hybrid systems can help to reduce the effect of cable's technical limitations, and may help system operators make more complete use of their existing cable networks.

- o **Costs.** Costs of videotext consumer equipment range considerably. Graphics capabilities and the amount of memory are the principle cause of price variations. American Bell's Sceptre terminal will be priced at $900. A Norpak NAPLPS decoder/keypad combination currently has a $1300 list price. By late 1983, or more likely mid 1984, Norpak plans to get costs under $500. The projected price for Norpak's integrated videotext terminal (includes a keyboard, keypad, monitor, decoder and processor) is $3400. Matra's integrated Antiope compatible terminal costs about $500. Prices are not expected to fall below $300 until mid-1985. In contrast, ASCII based terminals which can be used for text-only videotext can be purchased for as low as $200.

4. **Prospective equipment developments. The effects of high costs and limited** availability on the penetration of teletext and videotext equipment.

Emerging developments will help overcome

- o System operators are devising creative methods to accelerate the "roll out" of consumer equipment.

  - Keycom teletext subscribers lease their decoders from cable operators.

  - A personal computer manufacturer, along with a videotext system operator, plans to offer a reduced price for a personal computer with videotext capability and a subscription to the videotext service.*

  - Agreements between system operators and equipment manufacturers should accelerate availabliity and thus penetration of decoders and terminals. These agreements work to reduce the risk of both parties. Examples of such arrangements include Taft's five year agreement with Zenith to produce Prestel compatible decoders. Similar agreements have been made between the Time Video Group and Matshushita, and Knight-Ridder and AT&T.**

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* These organizations requested that their names not be disclosed.

** The Zenith decoder is now available for $300.

- The personal computer (PC) market is growing rapidly. In 1982 approximately .4 million households contained micro computers. By 1992, it is estimated that half of all American homes, 50 million households, will be equipped with personal computers. A few personal computers already have built-in videotext capabilities. Even more important, is the fact that most of the major personal computer manufacturers are in the midst of developing software which will allow their equipment to interface with videotext systems. In addition, hardware adapters like the one available for the IBM PC are now coming on to the market. Most of the modifications will provide for NAPLPS compatibility.

o Importance of personal computers. Personal computers will probably play a critical role in the development and success of videotext. In fact, many contend that personal computer penetration and evolving perceptions about its various applications and capabilities may become the most significant force behind videotext acceptance and market growth. The general belief is that stand alone terminals, especially expensive ones, will never gain significant acceptance. According to International Resource Development, Inc. "the bottom-line projection is that approximately 70% of videotext homes will be accessing data by microcomputer." (BMC 4.1.1.p. 5).

F. Regulatory and legal issues. Videotext and teletext regulatory matters fall under the jurisdiction of the Video Services Division, a group within the newly created Federal Communications Commission Mass Media Bureau. Recent FCC decisions regarding teletext and videotext reflect the Commission's strong free market philosophy. The FCC clearly has no plans to impose technical standards upon the industry. A recent decision stated that the determination of standards will be left to the marketplace.

o The most controversial FCC teletext/videotext rule to date involves the recent 4-3 decision that teletext content is not subject to the "must carry" their target audiences. The first ruling, in particular, is likely to be appealed.

- Other recent Commission decisions give broadcasters extensive freedom in the type of teletext they choose to offer, including private or closed user group transmission. On the other hand, broadcasters are restricted to carrying teletext on VBI lines 14-18 and on line 20. Lines 10-13 will be phased in for use on a predetermined schedule. For at least the next five years, Line 21 will remain the domain of closed captioning. Furthermore, for the present, full channel over the air teletext remains limited to MDS transmission. A final federal regulatory consideration, is that at this point there are no specific rules governing content requirements for either teletext or videotext.

- Beyond the scope of federal regulations, videotext-cable based in particular - is also subject to a growing amount of state legislation and city council rulings in connection with municipal cable franchises. Privacy legislation, the most pervasive, addresses records and data security issues. This form of legislation could impose burdens upon videotext system operators, especially if the laws vary from state to state.

IV. SUPPLY SIDE: COMMERCIAL AND EXPERIMENTAL VENTURES

A. Introduction. This section addresses the supply side of the teletext/videotext market and illustrates what is being supplied, by whom and how.

B. Types of Ventures. National magazine offerings, targeted and localized services characterize current teletext/videotext industry activity. These categories, as described below, will continue to exist within the overall teletext/videotext market, although the emphasis of new services will probably shift to targeted and localized services as the markets develop.

- National Magazine. These undertakings are characterized by big name players, substantial capital investment and state of the art technology. Examples include:
  - Knight-Ridder's Viewtron.
  - Keycom's VBI teletext magazine - Keyfax.
  - Time Video Group's full-channel teletext service.
- Targeted. These services are directed toward the needs of specific user groups and are usually videotext based. Examples include:
  - GTE Telenet's Medical Information Network.
  - Travelhost Inc.'s in-room hotel videotext system.
  - Corporate in-house videotext systems.
  - Agricultural services i.e. Agristar.
- Localized. Representative endeavors in this category are relatively unsophisticated. Examples include:
  - Advertiser-Tribune Videotext, Tiffen Ohio.
  - Louisville Courier Journal.

C. Teletext/Videotext Activity. Exhibit IV-1 provides a representative sampling of experimental and operational teletext/videotext ventures. The exhibit highlights four facts:

EXHIBIT IV-1 TELETEXT/VIDEOTEXT ACTIVITY*

	Primary Participant	Service Name	Principal Location	Partners	# of Users	Years of Operation	Generic Product	Technology	Transmission Method
Experimental: Teletext	CBS	Extravision	Los Angeles	KNBC, KCET, WGBH, Antiope Videotex Systems.	100	1981-82	VBI	Antiope	Broadcast
	NBC	Tempo	Los Angeles	KNBC, Antiope Videotext Systems.	80 sets	1981-83	VBI	Antiope	Broadcast
	KPIX	Direct Vision	San Francisco	Group W, Sparks Newspapers.	100	1982-83	VBI	Antiope	Broadcast
	Keycom	Keyfax	Chicago	Field, Honeywell, Centel.	50 sets	1981	VBI	Ceefax	Broadcast
	Time Video Group	To be determined	Orlando, FL/ San Diego, CA	Orlando Sentinel Star, San Diego Tribune.	400	1982-84 (Planned)	Full-Channel	NABTS	Satellite/Cable
Videotext	AT&T	Venture One	Ridgewood, NJ	CBS	200	1982-83	Text and Graphics	NAPLPS	Phone
	First Bank System	First Hand	Minnesota, North & South Dakota	None	250	1982	Text and Graphics	Antiope	Phone
	Knight-Ridder	Viewton	Coral Gables, FL	AT&T	200	1980-81	Text and Graphics	Prestel	Phone
	Times-Mirror	Gateway	Southern CA	None	350	1982	Text and Graphics	Telidon	Two-Way Cable/Phone
	On-Line Computer Library Center	Channel 2000	Columbus, OH	Banc One	200	1980	Text and Graphics	In-house	Phone
Operational: Teletext	CBS	Extravision	National	Local Affiliates	0	1983	VBI	NABTS	Broadcast
	Keycom	Keyfax	National	Field, Honeywell, Centel.	400	1982-	VBI	Prestel	Satellite/Cable
	NBC	Tempo	National	Local Affiliates	0	1983	VBI	NABTS	Broadcast
	National Captioning Institute	Closed Captioning	National	Sears	70,000	1980-	Line 21	Line 21	Broadcast
Videotext	Advertiser Tribune	A-T Videotext	Tiffin, OH	None	75	1982-	Text Only-Multiple	ASCII based	Phone
	Belo	Bison	Dallas, TX	None	200	1981-82	Text Only-Multiple	ASCII based	Phone/Cable Two-way
	Dow Jones	Dow Jones News/ Retrieval	National	Varies	75,000	1981-	Text Only-Multiple	ASCII based	Phone/Cable Two-way
	Knight-Ridder (Viewdata Corp.)	Viewtron	Dade, Broward and Palm Beach Counties, FL	Varies	0	1983 (Sept)	Text and Graphics	NAPLPS	Phone
	Videotex America	Gateway	Planned National	Times Mirror Infomart	0	1983	Text and Graphics	NAPLPS	Cable/Phone
	Warner Amex	QUBE	Columbus, OH (Multiple)	None	35,000	1977-	Text and Graphics	WAMEX	Two-Way Cable (Not fully interactive)
	Mead Data	Lexus/Nexus	National	None	Unpublished	1973-	Text Only-Subscriber	ASCII Based	Phone

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* It should be noted that change in this industry is so pervasive that specific details constantly become outdated.

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- The preponderance of industry activity is still experimental. While this industry has experienced a lot of activity, most commercial ventures are still in the planning stage.

- Virtually all ventures, whether experimental or commercial are currently operating on a limited scale.

- In terms of timing, most activity began in the past few years and much is already completed or suspended.

- Finally, with regard to geographic distribution, experiments are primarily local or regional operations while commercial endeavors tend to be more national.

D. Phases of Operation. In every industry, there are typically three phases of business operations. The first two, field trials and market assessments are experimental. The third phase consists of commercial operations. Activity is sharply distinguished by the nature and primary objectives of each phase. Most ventures go through the experimental phases, although some ventures, small ones in particular, may bypass the experimental stages and immediately begin operating commercially. Exhibit IV-2 illustrates the principal objectives of each operational phase.

1. Teletext/Videotext Experiments: Characteristics and Considerations. While experimental ventures in this field are quite diverse, there are a number of emerging patterns. These patterns can be best evaluated by the following criteria: size, structure, participant combinations, timing and follow-up actions.

   - Size. Teletext/videotext experiments generally function on a very small scale. Operations are limited both geographically and by the number of users.

     - Several experiments have less than 50 users, i.e., The Louisville Courier-Journal, WKRC-TV (Taft), and WETA.

     - The largest of the experiments, Time Video and Cox Indax (San Diego) still have 500 or less test participants.

EXHIBIT IV-2 - PHASES OF OPERATION

Phase 1 - Field Trials

- To assess user interest and acceptability
- To identify general consumer preferences
- To assess potential demand
- To determine a system's technical effectiveness.

Phase 2 - Market Assessments

- To measure the type and amount of product usage
- To determine price elasticities regarding consumers' willingness to pay
- To verify, to the extent possible, a sufficient population of paying consumers.

Phase 3 - Commercial Operation

- To generate revenues
- To augment the overall valu of the organization

- Structure. Most experimental ventures are structured as parallel agreements or joint endeavors. There are frequently no binding commitments beyond the testing phase.

- Participant Combinations. Within the context of experiments, two patterns of participant combinations appear most frequently. A very high percentage of these operations have at least one local component. Also, in many ventures, system operators team up with equipment manufacturers in an attempt to circumvent the chicken and egg constraints with regard to equipment availability.

- Timing. The time frame for most experiments is too limited to allow the novelty of the service to wear off.

  - Most experiments commenced within the last two years.

  - Activity has been generally short-lived, lasting from 6-18 months.

- Follow-up Actions. The results of teletext/videotext experiments have led to a variety of follow-up actions and management decisions.

  - Terminate. Some organizations completely terminated their activity in the teletext/videotext field. Oak Industries, for example, withdrew indefinitely from this market citing no near or medium, and questionable long-term, profit potential.

  - Suspend. Companies such as Cox Communications temporarily suspended their San Diego trial activities presumably awaiting "Go/No Go" decisions from management to commence commercial operations. A few public television experiments are also presently on hold while the questions of whether and how to proceed are deliberated.

  - Proceed. Some companies like Knight-Ridder, Times Mirror and the Time Video Group (TVG), are satisfied with the results of their trials. Knight Ridder plans to begin commercial operations in the fall of 1983, Times Mirror in mid-1984, and TVG sometime in 1984 depending on the timing of decoder availability.

- Pseudo-Commercial. Results from the Los Angeles teletext field trial lead CBS to progress into a pseudo-commercial mode of operation. Despite classification as commercial, CBS's current teletext activity is essentially only an extension of the official test phase. Specifically, CBS's commercial operations lack decoders, viewers and revenues.

2. Commercial Operations: Important Characteristics and Considerations. A number of teletext/videotext ventures, text - only videotext services in particular, are operating commercially and in some cases profitably as well. Scale, timing and geographic distribution are the most significant distinguishing features among these endeavors. Beyond text-only videotext services, there are limited areas of commercial activity throughout the industry.

   a. Text-only videotext. This category consists primarily of products offering variations of search and retrieve data base services to highly targeted audiences, professional groups in particular.

      - Scale. The scale of operations ranges from small to medium. Profit levels are moderate, but are expected to rise considerably over the near to medium term. Compared to the rest of the industry, the scale of these ventures is huge. In the context of the overall U.S. business environment, however, these activities are still relatively minor.

      - Timing. Some of the established businesses in this category, Lexis, Dow Jones, and CompuServe as examples, have existed for several years. Others, such as the GTE Telenet's Medical Information Network emerged within the last two years.

      - Geographic Distribution. These services are usually offered on a national level. Regional distribution exists in a few instances, particularly with regard to agricultural offerings.

b. Other commercial activity. Beyond text-only videotext there is at least one commercial example for each of the generic teletext/videotext products. Services in this category are generally highly targeted and/or localized.

- Scale. To date, activity in this category is represented by small scale operations. Examples include:
  - Internal corporate use of alphamosaic text and graphic videotext systems.
  - Use of Line 21 technology to provide agricultural data or an electronic billboard service.
  - "Teleguide", a text and graphics videotext system for public access of tourist and travel information.
  - Local teletext and videotext endeavors.
- Timing. Most national services are still in the planning stage. Numerous local services have operated commercially over the past few years, although most are not operating profitably.
- Geographic Distribution. Except for a couple of limited regional operations, distribution is predominantly local. Several services in the planning stage are developing national distribution capabilities.
- Keycom: An exception. Keyfax, offered by Keycom Electronic Publishing Corp., is the only genuinely commercial national teletext magazine at present. Keyfax, one of the most highly publicized commercial ventures in electronic publishing, has about 400 subscribers and according to Keycom officials is already operating profitably.

c. Commercial failures. Though the industry is relatively young, some operations have failed or withdrawn from the market. Others remain but are experiencing serious financial difficulties.

- Probably the most recent significant failures are those of Homserv and its sister company Viewmart. In early May the parent corporation, American Can, announced the closing of its videotext subsidiaries.

- Belo Information Systems Online Network (BISON), the first regional commercial videotext service lasted less than one year as a commercial service. An underestimated home computer population is cited as the cause of the service's demise. According to Gean Holden, a Belo V.P. "we were ahead of our time. But we are still committed to videotext... The experiment was a success, but there were not enough terminals out there." (from interview).

- Micro TV, one of the pioneers in the U.S. hardware segment of this business, cited the lack of standards and of a commercial user base as reasons for discontinuing its teletext operations.

- New York Times Information Service. Since its inception in 1974, The New York Times Information Service has incurred average annual losses of $1 million. As a result, in early 1983, The New York Times Co. decided to phase out marketing and computer operations for the service. Mead Corp. assumed responsibility for distributing the product and now pays royalties to The New York Times Co. for the service.

- The Source. Source Telecomputing Corp. (STC) has periodically suffered financial difficulties. In 1980 Reader's Digest acquired controlling interest in STC and revitalized it with a significant cash infusion. Two years later another company, Control Data Corporation, committed to provide STC with over $5 million in exchange for a percentage of ownership.

E. Venture Motivations. The teletext/videotext markets reflect activity by players who are driven by both defensive and aggressive business motivations. The most aggressive and innovative players in this field tend to be system operators; while information providers (IP's) typically assume more reactive, defensive stances. As indicated below, defensive motivations range considerably:

- Protecting market share is a primary concern for publishers, retailers and financial institutions. The threat of diversion of advertising revenues to new media increases involvement by newspaper and magazine publishers.

- Meeting competitive pressures is a motivation behind a variety of actions, especially the television networks' teletext endeavors.

Aggressive motivations are also diverse. Examples of the forces driving aggressive market behavior and strategies include:

- The desire to be on the leading edge of new technologies. This is especially true for companies like IBM and American Bell.

- The drive to identify and exploit new business opportunities.

  - For companies like Dow Jones, electronic publishing offers an opportunity to pursue new, although related lines of business.

  - Other ventures regard teletext/videotext as a profitable new way to use existing organizational resources. Contel and other independent telephone companies' use of established communications networks can be perceived in this context.

- The drive to enhance current product or service offerings as exemplified by the networks' involvement in VBI teletext, is another aggressive motivation.

- The opportunity to expand current market share entices involvement by transaction providers such as financial institutions and retailers. Chembank, for instance, recognized that while financial transactions are an attractive videotext item - They do not sell well on a stand-alone basis. Thus, Chembank developed "Pronto" to repackage the product that they really want to sell.

F. Industry Players. Teletext/videotext industry participants can be classified into two general groups: lead players and secondary players. This section assesses the nature and major implications of these categories from two perspectives: line of business, and resources and capabilities.

1. Lead Players.

Exhibit IV-3 provides a representative sampling of lead players categorized by their primary line of business. As the chart indicates, lead players in this industry are large, well-known, corporations able to absorb a significant amount of risk.

- Line of Business. Lead players include: publishers, broadcasters, communications "network" providers, communications equipment suppliers, financial institutions and national retailers. For most of these firms, teletext/videotext is considered either a supplemental business endeavor or a "high-tech" extension of their current line of business.

- Resources and Capabilities.

    - These companies have the financial resources to develop this market and their place within the market.

    - The investment in electronic publishing for these firms is not extreme relative to their other activities.

- Exception: Foreign Equipment Manufacturers. In the equipment supplier category, there are exceptions to the qualities associated with major participants: lead players that are not large are foreign. This reflects the overseas origin of the teletext/ videotext business. Furthermore, for foreign equipment suppliers, teletext/videotext generally constitutes their sole line of business.

EXHIBIT IV-3 - LEAD PLAYERS

Publishers	Broadcasters	Communications Network Providers	Communications Equipment Suppliers	Financial Institutions	National Retailers
Copley	CBS	AT&T	DEC	Chembank	Sears Roebuck Co.*
Knight-Ridder	NBC	Cox Communications	Honeywell	Chase	J.C. Penney
Dow Jones		GTE Telenet	IBM	ADP	
Time Inc.		Independent Telephone Companies	Zenith		
Times Mirror			Norpak		
Readers Digest			VSA		

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*Sears could also be considered a financial institution.

2. Secondary Players.

In the teletext/videotext industry the secondary players are typically smaller organizations with less available resources than the lead players. For the most part, these players have targeted niches and are trying to fill "identified needs".

- Line of business. For some of these organizations, i.e., CompuServe and Travelhost, teletext or videotext is the major if not exclusive line of company business. The remaining players are usually information and/or transaction providers.

- Resources and Capabilities. These players tend to have more limited resources, especially with regard to discretionary funds. While their investment in teletext/videotext may be small on an absolute basis, for many the relative risk and exposure may be substantial.

G. Participant Roles. There are four functional roles within the teletext/videotext industry: information/transaction providers, system operators, transmitters, and equipment manufacturers. For every system in operation each of these functional roles must be filled. Following are descriptions of the responsibilities and requirements for participants in each of these roles. Exhibit IV-4 gives a sampling of the types of organizations currently filling each of the roles discussed below.

- Information Providers (IPs)

  - Responsibilities. The tasks associated with this role include collecting or transforming data, processing or reprocessing the data, and editing overall content. Some IP's create their own frames/pages of information while others leave this responsibility to the system operator. The latter alternative usually involves payment to the system operator for "IP services."

- Requirements. The only requirement for an IP is the possession of desirable information. Depending upon an IP's resources, technical skills and business objectives, involvement can range from the simple provision of data to a system operator to creating the "frames" and even handling a portion of the billing.

o System Operator.

- Responsibilities. System operators have final responsibility over the design, function and quality of teletext/videotext systems. The management functions include: user billing, data storage and indexing. For those IP's that do not have page creation capabilities, the system operator also assumes responsibility for formatting the IP's information into usable frames. Finally, the system operator usually coordinates the developmental and marketing activities, including advertising and sales.

- Requirements. A system operator needs management and marketing skills and access to a distribution network. Another critical operator requirement, for all but the least sophisticated systems, is substantial financial resources.

o Transmitter.

- Responsibilities. Transmitters provide the communications network for distributing information. For videotext, transmitters also connect remote databases, through gateways, to the local or "home" system facilities. The various links of a network are frequently provided by more than one transmitter.

- Requirements. Transmitters need the network and technical infrastructures.

EXHIBIT IV-4 - INDUSTRY ROLES

Information Providers	System Operators	Transmitters	Equipment Manufacturers
Communications Conglomerates	Communications Conglomerates	Communications Conglomerates	Equipment Manufacturers
Major Publishers	Communications Network Providers	Communications Network Providers	
Local Newspapers	Major Publishers	Other Non-specialized Carriers (i.e. SSS)	
Advertisers	Local Newspapers		
Financial Institutions	Financial Institutions*		
National Retailers	National Retailers*		
Specialized Institutions (i.e. AMA)			

* Not currently involved in this role for teletext.

- Equipment Manufacturer.
  - Responsibilities. Equipment manufacturers may either produce complete turnkey systems or a single or limited number of the system's hardware components.
  - Requirements. The two essential components for equipment manufacturers are production facilities and sales distribution networks.

Exhibit IV-5 contains a matrix which was developed by a major industry participant in order to assess the comparative advantages of current and potential players in teletext and videotext.* The strengths under consideration reflect this organization's perception of the vital criteria for industry success.

2. Specific Role Playing. Role playing patterns within teletext and videotext are frequently overlapping and are best understood within the context of the generic products provided.

- Teletext. Functional roles in teletext are typically not divided. This may be primarily due to the well-defined technical parameters of even the most sophisticated operations. However, the role of information provider may become differentiated as systems mature and expand their advertising base.

  Exceptions: The Keyfax national teletext magazine is the most visible exception to this pattern. Keycom Electronic Publishing acts as the IP and system operator for Keyfax. The magazine is transmitted over the VBI of WTBS by Satellite Syndicated Systems.

- Text-only videotext. In most ventures in this category, the system operator serves as an information gatherer rather than provider. Information providers are generally external to the venture. Transmission

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* This company requested that its name not be disclosed.

EXHIBIT IV-5

Company name (listed across)

Strengths

-nationwide distribution
-service and maintenance
-entertainment software
-video games
-information bases
-communications network
-direct electronic home access
-technology
-hardware manufacturer
-financial services
-capital resources
-willingness to compete
-importance of residential strategies
-current market penetration into the home

services are also external to the venture. Consumers pay the telephone company or the base timeshare company directly.

Exceptions:

- GTE Telenet serves as a system operator and transmitter with the American Medical Association as IP.

- Dow Jones generally performs two roles: IP and system operator. In some instances, however, they have their own cable systems and thus become a transmitter as well.

o Text and Graphics Videotext. Activity in this segment of the industry is still largely pre-operational. Planned operations are typically very large scale and the product offering is multi-faceted. Roles in this market are not clearly defined, thus players must be flexible in their approach.

- Knight-Ridder's Viewtron typifies the flexibility in this market. During the experimental phase, Knight-Ridder served as both the system operator and prime IP. For commercial ventures with local newspapers, the local papers will function as system operators while Knight-Ridder acts primarily in an IP capacity. The company's other responsibilities will include selling national advertising and providing the system software.

- Cox Communications, upon entering the videotext business, assumed the responsibilities of every functional role except equipment manufacturer. Through the course of their experimental operations with INDAX, Cox's roles has evolved to the point where they now serve almost exclusively as a system operator.

- AT&T represents a single entity which assumed different functional roles in separate ventures. In the Viewtron experiment with Knight-Ridder, AT&T functioned as the transmitter by furnishing the communications lines and as the supplier for both special page creators and consumer terminals. Knight-Ridder, as noted, functioned as both the system operator and prime IP. In the Ridgewood experiment with CBS, AT&T played a quasi system operator role in addition to the two other roles noted above.

- Teletext/Videotext. A final note in this section is that there are lead players, like CBS and Keycom that are pursuing both teletext and videotext endeavors. Keycom is system operator and prime IP in each operation. CBS on the other hand, acts as system operator, prime IP and transmitter in teletext. In videotext, the broadcaster's role is limited to IP and some system operator functions.

H. Venture Structures. Business ventures in the teletext/videotext industry are generally structured as solo operations, parallel agreements or joint ventures. Another recently introduced alternative is the franchising arrangement promoted by Chembank with its Pronto service.

- Solo Operations. In solo operations, an individual organization performs any one or combination of functional roles itself. Additional required services are purchased from external suppliers.
  - Text-only videotext ventures are almost exclusively solo operations. The prime exception to this pattern is the GTE Telenet/AMA venture.
  - Local teletext/videotext services are frequently solo operations. Examples include A-T Videotext in Tiffin Ohio and the Toledo Blade's Viewfax.
  - The CBS national teletext magazine, Extravision, is a final important example of a solo operation. It should be noted, however, that the successful distribution of this network offering is dependent upon the affiliates.
- Parallel agreements and joint ventures. These structures are typically composed of two to three players. The value of these arrangements arises from the opportunity to spread the financial risk and from the fact that players bring complementary functional strengths to the operations. The objective is to pool resources and capabilities in order to minimize or eliminate the need to pay for outside services including "buying" capital. The most prevalent combinations are IP's with system operators, system operators with equipment manufacturers and local "components" with national system operators. The exact combinations are dependent upon requirements of the specific situations.

- Keycom Electronic Publishing, a joint venture between Field Enterprises Inc., Centel Corporation and Honeywell Inc., was established as a prototype venture structure within the teletext/videotext industry. The individual entities come from distinctly different disciplines. Collectively they contribute complementary functional and financial skills and strengths which are essential to success in the teletext/videotext business. As the president of Centel summarized the situation:

  > "Keycom is the first marriage of an information provider, a computer systems manufacturer and a communications delivery specialist to form a commercially available videotext service. Utilizing Field's communications and publishing background, Honeywell's technical expertise and Centel's experience in marketing and managing information delivery systems, this new venture will provide to consumers advanced sophisticated videotext and teletext services". [BMC-3.2.1. p. 14]

- Regional or national ventures with separate localized components are typically set up as joint ventures. Usually in these situations subsidiaries are established. The newly formed subsidiaries subsequently enter into joint venture agreements with local players across the country. This structural model is implemented for both teletext and videotext operations. Major ventures which are structured in this manner include Knight-Ridder, Times Mirror and the Time Video Group.

o Franchises. Chembank's franchising structure enables any bank to license the right to use the Pronto system. Pronto provides a variety of home banking services along with other informational and transactional offerings.

o Venture Structure: Experimental to Commercial. The structure of teletext/videotext ventures tends to change between the experimental and commercial phase of operations. In the experimental stage, joint agreements are the most prevalent structure.

As commercial operations evolve, there is movement towards establishing independent ventures. Increasing emphasis is placed upon buying external services to compensate for the absence of in-house capabilities. Joint ventures in commercial activities are mainly focused on the need for local information and distribution. Examples of organizations evolving from the experimental to the commercial stage include:

- CBS - which launched its own commercial operation after participating jointly with NBC and KCET in the Los Angeles teletext field trial.
- Knight-Ridder - whose agreement with American Bell expired at the conclusion of the Viewtron experiments. On the commercial level the company will operate independently. Venture partners, as mentioned, will only be sought on a localized basis.

I. Financial Considerations. This section discusses financial considerations including investment and operating costs, sources of funding, sources of revenues and projected returns for system operators in the teletext/videotext markets.

At present, information on many financial areas of teletext and videotext is not available. This is due to the fact that the industry is still in the development phase and relatively little is known about operating costs, rates of return and profits. In addition, companies that have begun ventures or are in the planning stages are reluctant to release data on costs and projected levels of revenues and returns. Nevertheless, some data are available and are discussed below.

1. Investment and Operating Costs. There is a large variance in investment and operating costs based on two primary considerations: first, whether the system is teletext or videotext and, second, the scope and sophistication of the service.

   a. Investment costs include the price of equipment and facilities, research and development, market tests and all pre-operating expenses. Representative investments, for teletext and videotext are as follows:

      o Teletext.

         - The least sophisticated teletext operation requires capital equipment costs of $5,000-$15,000 for a simple data bridge. Development costs are not usually required.

- A national VBI magazine requires an initial investment of at least $200,000 to $500,000 for capital equipment (software not included.) Development costs will depend on the scope and sophistication of the effort. Total investment may be in the millions. Network affiliates can expect to spend about $200,000 if local production/supplemental capabilities are desired.

- A national full channel operation - the high end of the teletext product scale-can involve up to $10 million in investment and pre-operating expenses.

o Videotext.

  - The investment requirements for a small in-house videotext system may be as low as $100,000, including computers, software and frame creation equipment.

  - To launch a full scale, national videotext system may require up to $30 million in investment.

b. Operating costs. Operating costs consist primarily of staffing expense, overhead, peripheral equipment requirements, system maintenance and basic financing costs.

Staffing requirements for both teletext and videotext vary widely with the scope and sophistication of the product offered. Staff is needed for management, editorial functions, system maintenance, frame creation and marketing. Exhibit IV-6 shows representative staffing needs excluding management and administrative staff.

Exhibit IV-6

Staffing Requirements*

Teletext		Videotext	
Local 100 page VBI magazine, no marketing	1 artist 2 page creators	In-house system supplied initial data base, limited local input, no marketing	2 page creators 1 computer programmer
Local component of a full-channel teletext operation	12 content people 1 engineer 1 marketer	Limited local system	12 content people 2 engineers/computer programmers 3 marketers
National full-channel teletext magazine with developmental operations	80 R&D 11 writers 10 artists 10 editors 15 marketing	National with developmental operations	40 programmers 60 content staff 15 marketing

After the developmental phase, the engineering and computer component is typically reduced along with a possible reduction in the content staff.

* Estimates based on interviews.

c. Sources of Funding. In this industry, financing is typically obtained from internal operations or from the sale of equity. Patterns indicate that the choice of funding sources reflects the financial strength and the primary lines of business of the venture participants.

- Internally generated funds. Large organizations that regard teletext/videotext as a supplemental line of business rely almost exclusively upon funds from internal operations.

- Sale of equity. Smaller organizations that are devoted largely or exclusively to teletext/videotext activities frequently receive major portions of their capital from selling equity positions in their firms. Sales of any percentage of the firm may be involved. As examples:

  - Almost 100% of The Source's stock is held between Readers Digest and Control Data Corporation.

  - CompuServe is a wholly owned subsidiary of H&R Block.

  - J.C. Penney & Co. recently purchased a 100% interest in the First-hand Videotext system.

- Venture Capital. At present venture capital is not a suitable means of financing teletext/videotext endeavors. This is due to the long delays in expected returns and in some instances the high investment requirements. In the future there may be exceptions, particularly with regard to small, highly targeted operations.

2. Sources of Revenue. There are six potential revenue sources for teletext/videotext operations. Potential revenue sources for each of the generic teletext/videotext products are determined by technical constraints and by the targeted audience. Overall, videotext offers more revenue opportunities than teletext. Following are brief descriptions of the potential revenue sources and how they apply to the generic products.

a. Advertising. The primary variables which determine advertising revenues are: a system's data capacity, amount and time of projected consumer usage, graphics capabilities and the demographics of the targeted market audience.

- VBI teletext. Advertising will be the dominant revenue source. Communications Studies and Planning International (CSPI) projects that advertising income for a 250 page "magazine" will average about $7 per household per year [CSPI].

- Full channel teletext. Advertising revenues per household are expected to exceed those for VBI teletext. This is due to the increased page capacity, higher projected usage time, a more targeted "upscale" audience and enhanced graphics capabilities.

- Text and graphics videotext. Advertising income per household is expected to be $49.00 per year [CSPI]. Advertising revenues are expected to be the dominant revenue source for text and graphics videotext. Most systems currently intend to be 50-75% advertiser supported.

b. Subscription fees. Fees are based on the perceived value of the information as well as the technical sophistication of the system. Although the technology is available for scrambled systems, subscription fees are unlikely for teletext, except for full-channel, due to limited capacity and the nature of the product.

- Full channel teletext. Subscription charges will range between $5-$20 per month. These revenues will frequently be shared between the system operator and the local cable operator and often will include the cost of leasing a decoder.

- o Text-only videotext. Subscription fees may be levied on a one time or monthly basis. Dow Jones News/Retrieval subscriptions range from a $50 monthly fee to a $50 one time "password" fee. The GTE Telenet Medical Information Network has a $100 one-time subscription fee. The New York Times Information Bank has a $200 initial fee and no monthly fee. Most services with no monthly subscription fee have usage fees, with rates as high as $165 per hour.

- o Text and graphics videotext. Quotes for subscription fees run from $10-$75 per month. The most likely range will be between $15-$25.

c. Usage fees. Each of the videotext products may derive income from various pay-per-use service applications. Systems have different, frequently complex usage fee structures, depending primarily on the systems operators marketing objectives. Usage fee structures are currently applicable only to text-only videotext. In the future, text and graphics videotext will probably incorporate this device as well. Videotext operators tier usage fees in a fashion similar to cable systems: a flat rate for basic service with charges increasing as additional services are used.

d. IP Services. In certain circumstances system operators may derive additional income by providing services such as updating and frame creation to information providers that lack these capabilities. This revenue possibility applies to videotext, full channel teletext and, to a lesser extent, VBI teletext. For videotext, the financial benefits from IP services may be substantial. Although there are no industry standards yet, the following stated Viewtron rates may be informative:

Input -	$15 per frame
Update -	$ 5 per frame
Design -	$45 per frame (including input)

e. Transactions and Electronic Messaging. Any of the videotext services may derive income from transactions and/or electronic messaging. The contribution of these activities to total revenue is presently very small but expected to rise appreciably. With regards to transactions, processing charges may be levied upon the consumer and/or the retailer. Viewtron, for example, assesses the retailers 1% of the sales order. Electronic messaging charges for telephone based systems depend primarily upon connect time. The GTE Telenet Medical Information Network, Med/Mail, charges from $7-16 per hour.

f. Closed User Group (CUG) Operations. Subscriber fees for current or proposed CUG systems are negotiated on a case by case basis. The actual figures for operations like Buick's Informart system are not publicly available. Certain public access closed user systems, like Teleguide and KCET's electronic billboards are 100% IP supported.

J. Services. This section describes the nature of teletext/videotext product offerings and specific service applications. It also provides estimates of current and anticipated demand for the various services. All products can be classified in terms of whether they are direct substitutes for current offerings, enhancements of available products or new and unique. Thus far, most teletext/videotext service offerings have been alternatives or enhancements of what is currently available. For example:

- Basic information services offered via teletext/videotext can be viewed as substitutes for current information sources, such as radio, TV, magazines, encyclopedias and newspapers.

- VBI teletext can be perceived as an enhancement to television programming.

- Teleshopping is considered an improvement over catalogue shopping.

Teletext/videotext have the potential to provide entirely new services to the consumer. To date, however, nothing completely new or unique has materialized. The concept of uniqueness is crucial to teletext and videotext. The evolution of the cable industry provides an informative analogy. Initially, cable growth was moderate, providing service only to those who had limited or no TV reception. The introduction of new and unique services like HBO and Showtime, were driving forces behind the rapid expansion of cable systems and subscribers.

There are five general applications of teletext/videotext: information retrieval, education, advertising and messaging, transactions and telemonitoring. Following are brief discussions of five general applications and of the distinctions between the respective service capabilities of teletext and videotext.

1. Applications

- Information. The emphasis of all current services is information. Offerings range from general news, weather and sports to detailed legal, medical and financial information, encyclopedias and any other specific or general information that is commercially viable.

- Education. At this time planned residential services offer a minimal amount of educational programming, mainly in the form of drills. Experiments both in the classroom and in the home have shown these exercises to be tedious. Education via teletext or videotext in the institutional market appears to suffer from problems similar to those experienced by computer-assisted instruction in general. These include a shortage of high quality material (software), fear of teachers that they may ultimately be replaced by computer instruction, the general resistance of the school systems to change, overall teaching effectiveness, the cost and time involved in purchasing equipment, and problems in fitting this kind of instruction into the general curriculum. Videotext in particular offers advantages to this market in terms of its interactive qualities; however, it appears that significant resources will have to be devoted towards promoting the usefulness of these systems within institutions for this market to truly develop. Personal computer manufactures and software developers are now beginning to make that investment.

- Advertising, messaging and transactions. The areas of teletext/ videotext advertising, transactions and messaging are still largely undeveloped. However, these applications are expected to grow in use as a critical mass of users develops.

- Telemonitoring. Telemonitoring applications in residential energy or security management are extremely scarce, due largely to technical problems. Systems like Warner's Qube and Cox's Indax offer these types of services; however, demand for these services has not met original expectations.

2. Teletext. Unless modified by telesoftware, teletext capabilities are limited to information retrieval. Telesoftware enables users to perform some basic computing functions. Teletext's key strength is its timeliness and its ability to provide continuous information updates. VBI selective teletext is also valuable as a "wrap around" supplement to television programming and advertising.

3. Videotext. Videotext can be used for all five applications listed above, although individual systems' capabilities vary depending upon the technical configuration and intended use. Today, interactive capabilities - the ability to perform transactions, play video games, etc. - constitute videotext's main advantage.

4. Distinctions between teletext/videotext. The distinctions between teletext/videotext service offerings, applications and capabilities are:

   o Teletext is technically incapable of offering services such as transactions and messaging.

   o For services which can be provided by both teletext and videotext, videotext's treatment of the individual product offerings is almost invariably more advanced. Specifically:

     - Videotext's potential coverage of general information, financial information and advertising is substantially more extensive than is technically feasible for VBI teletext. This is generally true even when compared to full-channel teletext.

     - For games/entertainment and education, videotext has the technical "interactive" advantage over teletext. This enables videotext's treatment and presentation of these fields to be comparatively more sophisticated.

K. The Foreign Experience. While teletext/videotext activity is taking place in countries around the globe, the teletext/videotext industries in only three nations - England, France and Canada - have much relevance to the U.S. Even in these cases, applicability of experience is extremely limited. This section provides brief descriptions of teletext/videotext developments in the above

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listed countries, an analysis of the primary distinctions between the foreign and American situations and finally a discussion of the relevant areas of similarity.

1. Background Developments and Current Number of Users. In contrast to many new telecommunications technologies, teletext and videotext origins are European rather than American.

   - Britain. In the U.K., nationwide public teletext services (Ceefax and Oracle) were first introduced in 1976 while a commercial viewdata (videotext) service, Prestel, began in 1979. The U.K. boasts the highest domestic user populations with 24,000 Prestel subscribers and almost 800,000 teletext consumers. (Arlen 4/83 p. 12).

   - France. Teletext and videotext emerged in France during the 1970's with the first major system implementations in 1980. The French teletext/videotext audience numbers about 10,000. Over half of this figure represents Electronic Directory users.

   - Canada. Canada's interest in teletext/videotext dates back to the mid-1970's. However, major applications have only taken place since 1981-1982 when the government became heavily involved with the development of Telidon. Almost 3,000 Canadians receive some form of teletext or videotext. This does not include users of public access systems.

   - Other countries. Most other teletext/videotext developments in Europe and in many nations throughout the world have been based primarily on the British format.

2. Niches. The European systems seemed to have found their niche in the business arena and are generally aimed at providing rapidly changing information to a large volume of users. Canadian services are apt to be aimed at specialized markets such as agriculture, education and tourists.

   - Videotext. Videotext services are heavily business oriented in both England and France. There is also substantial emphasis on CUG operations for in-house corporate use. Service applications are based primarily on information retrieval functions. One of the highlights in France is the recently launched ten year plan to replace paper telephone directories with electronic versions. Canadian services are generally public access with large data bases providing information on tourist services, news and business and government data. An interesting application is the Ontario-based OTNET educational service which provides a 30,000 page data base of information on careers and training opportunities.

- Teletext. The residential teletext market in England is relatively large. The three major television networks each provide 100 page general magazines. Teletext in France contains a strong business emphasis. Canadian teletext services are well-developed and are limited to an experimental magazine developed by the Canadian Broadcasting Corporation and an educational magazine available as part of OTNET.

3. Why foreigners turned to America. Beginning about 1980, a number of forces prompted the British, the French and later the Canadians to enter the U.S. teletext/videotext markets.

   - The United States seemed like a logical market for introducing teletext/videotext. The potential appeared huge and the Americans lagged behind in teletext/videotext market.

   - Britain, France and Canada all wanted to recoup their investments and insure themselves a position in the new market.

   - In Britain, teletext/videotext began to settle into the growth/ maturity phase of market development. Thus, it seemed time to direct marketing efforts elsewhere.

4. Fundamental differences between the market dynamics, industry structure and the nature of information needs limit the relevance of the foreign teletext/ videotext experience to the U.S. situation.

   - By far the most important differentiating factor is government support. By employing both financial and policy based mechanisms, foreign governments greatly assisted in the emergence of this industry and the development of their domestic markets.

- Subsidies have been substantial. Over the last five years, combined government subsidies in Europe, Canada and Japan exceeded $300 million, [BMC 2.0 p.2] England has spent over $60 million on Prestel alone (Business Week 3/22/82) while Canada has spent approximately $40 million on its teletext/videotext activities.

- Policy-wise, the governments impose various conditions which require implementing teletext/videotext. The mandated French electronic directory program is a good example.

- Direct involvement by the French, British and Canadian governments is extensive. Particularly in Europe, the governments essentially act as the principal "venture" partners. Most additional participation is limited to IP functions.

o Role of PTT's in Europe and Bell Canada. Within the context of heavy government support, the PTT (Postal Telephone & Telegraph Administrations) in Europe and Bell Canada, the prime Canadian telecommunications carrier, have taken leading roles in developing and promoting these new information technologies. AT&T, in contrast, has been inhibited by regulation. As a result, the company has not been overly aggressive beyond the basic transmission and equipment arena. The divestiture agreement clarifies most of the relevant questions. For the next seven years AT&T and the local operating companies are prohibited from the "creation or control of the information to be transmitted."

o Disparity between the range of available information services in the U.S. versus other countries is another major factor limiting the application of the foreign experience.

- Foreign teletext/videotext applications emphasize information retrieval since alternative sources of this type of service are limited.

- The United States, in contrast, has a high penetration of alternative information services such as computer timesharing and personal computers. Consequently, a new form of information retrieval based service is comparatively not as valuable.

5. Areas of Relevance. At this point, foreign experiences in teletext/videotext overall have only marginal applicability in the U.S.

- Due to the differences noted above, there is especially little relevance with regard to why and how the market developed.

- One area of possible relevance concerns the European's shift from a strong residential orientation to a predominately business sector focus, especially for videotext. The degree of applicability will remain uncertain until the "popular" systems in the U.S. become established. It is interesting to note that in Britain, for example, Prestel was first envisioned as an in-home system which employed converters, existing televisions, and telephone lines. Because the public response was less than overwhelming, Prestel was retargeted to the business sector. At this point, less than 20% of the total Prestel subscriber pool are residential subscribers. (High Technology 5/83).

- Some areas of relevance do exist. They lie primarily in the realm of technology and consumer preference.

  - The technical achievements attained in other countries are largely "transportable." As a result, the teletext/videotext technologies were at a relatively advanced state of development at the time they were introduced in the U.S.

  - The U.S. has acquired some valuable insights into consumer tastes and preferences as a result of the foreign experience in teletext/videotext. Useful information in this category includes indications of strong demand for breaking news, sports and financial market changes, and a limited tolerance for waiting time.

V. DEMAND FOR TELETEXT AND VIDEOTEXT

A. Introduction. Consumer demand for teletext and videotext services is in the beginning stages of development. The general public is largely unaware of these technologies despite the publicity that surrounds the industry. Demand is further constrained by the lack of equipment and by the scarcity of publicly available services. This market is clearly not presently driven by the consumers of the product. Instead, the system operators, equipment manufacturers, and information providers are encouraging development. Nevertheless, the ultimate success of the industry will be determined by consumer interest in and acceptance of electronic publishing and teleservices. Because of the real importance of the consumer to this industry, this section is devoted to a discussion of demand. The first part of this section, presents findings on the current levels of usage for both teletext and videotext services. In the second section, characteristics of users will be discussed. (Projections of future use are discussed in Section VI, "Scenarios of Market Evolution".)

B. Levels of Usage for Teletext and Videotext. Exhibit V-1 presents current levels of usage for experimental and commercial teletext and videotext services. In addition to showing the number of users for each system, the exhibit also notes whether major access to the system is in public places or in private homes, the phase of operation of the system, and whether or not a charge is required for the system. It should be noted that, due to the emerging nature of the industry, the figures on numbers of users can be expected to change on a short-term basis. Several interesting points emerge from this survey of teletext and videotext users.

1. Limited Number of Users. Despite the large number of services that are being offered either on an experimental or commercial basis, very few people have actually had exposure to teletext or videotext.

   - Line 21 services have the largest exposure because of the number of people taking advantage of captioning for the hearing-impaired.

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EXHIBIT V-1

USAGE OF TELETEXT AND VIDEOTEXT SERVICES

System	Number of Users	Type of Access	Phase of Operation	Charge Required
Teletext				
Line 21				
Closed Captioning	240,000	Private	Operational	Yes - Decoder
KBIN	5,000[1]	Private	Operational	Yes - Decoder
KFME	200	Private	Operational	Yes - Decoder
KOZU	100	Private	Operational	Yes - Decoder
KUON	400-500	Private	Operational	Yes - Decoder
WEDU	N/A	Private	Operational	Yes - Decoder
KCET	200	Public	Operational	Yes - IP
WHA	N/A	Private	Operational	Yes - Decoder
VBI				
CBS	0	Private	Operational	Yes - Decoder
KCET	80	Public	Completed	No
Keyfax	400	Private	Operational	Yes - Multiple
KIRC	2	Public	Completed	No
KPIX	100	Private	Operational	No
KSL	10	Private	Completed	No
NBC	0	Private	Operational	Yes - Decoder
WETA	50	Private/ Public	Completed	No
WGBH	20	Public	Operational	No
WKRC	50	Private	Operational	No
Full Channel				
Time Video Group	300	Private	Experimental	No
Videotext				
A-T Videotext	75	Private	Operational	Yes - Multiple
Agritext	50	Private	Operational	Yes - Multiple
Bison	200	Private	Suspended	Yes - Multiple
Contelvision	100	Private	Experimental	No
Electronic Editions	200	Private	Experimental	No
Firsthand, Minneapolis	250	Private	Completed	No
Indax, San Diego	500	Private	Experiemental	No
Startext	510	Private	Operational	Yes - Multiple
Bank at Home, Knoxville	200	Private	Operational	Yes - Multiple
Chase Manhattan	N/A	Private	Experimental	No
Channel 2000 (OCLC)	200	Private	Completed	No
CompuServe[2]	44,300	Private	Operational	Yes - Multiple
Dow Jones	75,000	Private	Operational	Yes - Multiple
First Interstate Bank of California	250	Private	Operational	No
Home Base - Citibank	100	Private	Experimental	No
Indax, Omaha	25	Private	Experimental	Yes - Multiple
Master Key	25,000[3]	Private	Anticipated	Yes - Multiple
Pronto - Chemical Bank	450	Private	Operational	Yes - Multiple
Qube	N/A	Private	Operational	Yes - Multiple
The Source[2]	34,000	Private	Operational	Yes - Multiple
Times Mirror	350	Private	Completed	No
Viewtron	5,000[3]	Private	Anticipated	Yes - Multiple
Venture One	100	Private	Completed	No

1. Figure may include decoders for captioning.

2. Limited interactive capability.

3. Anticipated number of subscribers in first years of operation.

BEST COPY AVAILABLE

- VBI Teletext services are or have been available through less than 1,000 decoders. (This figure understates the actual number of viewers, because two of the systems had decoders placed in public areas such as schools and shopping centers and because in some of the experiments decoders were rotated among households on a regular basis.)

- Full Channel Teletext services have had a very limited audience with only one experiment being tested by 300 people.

- Videotext services that lack remote access capabilities and thus are not fully interactive have been available to less than 1,500 viewers.

- Videotext services that are 2-way interactive have had greater exposure because of the comparatively large number of subscribers to The Source, CompuServe and Dow Jones. Combined, these services have close to 150,000 subscribers. However, the number of people who have used interactive services is only about 1,700 if one excludes CompuServe, The Source, and Dow Jones services.

2. Access. All but five of the teletext and videotext systems that are included in this survey are accessed through decoders placed in the home. Attempts to stimulate demand through publicly placed decoders have been extremely limited. This situation differs markedly from the Canadian experience, where several services, such as Teleguide in Toronto, are available through publicly accessed decoders.

3. Paying Participants. The number of people who are willing to pay for teletext and videotext services is an important indicator of the actual demand for the services. Of course, these figures must be viewed with some caution because of both the limited number of decoders available and the limited reach of many of the services.

   - Line 21 services are available at no cost. However, because consumers must purchase a decoder, all users of these services have indicated a willingness to pay the initial cost of the decoder.

- VBI Teletext services are, with three exceptions, made available to consumers through the free distribution of decoders, generally on an experimental basis. The exceptions are CBS, NBC, and Keyfax. Both the CBS and NBC services will require viewers to purchase decoders. At present, however, no external decoders are available. Keyfax, which is available over cable, requires both the purchase or lease of a decoder and a subscription fee.

- Full Channel Teletext has only been available on a experimental basis with the decoders provided at no cost to the consumer.

- Videotext services that are not fully interactive have been purchased by less than 1,000 consumers. However, Bison, a service that has been suspended, accounted for 200 of these consumers.

- Videotext services that are fully interactive have the largest number of paying subscribers. All CompuServe, The Source, and Dow Jones participants must pay for the service. Services that should be introduced in the fall of 1983 hope to have up to 30,000 subscribers during their first year of operation.

C. Characteristics of Teletext and Videotext Users. Information on the characteristics of teletext and videotext users -- who they are, what viewing preferences they have, how much they use the system -- is quite limited. This is because many services will not release information they have collected on their audiences. Such information is often considered critical in establishing a leading service and system operators do not want to release the data to competitors. Information that is available is usually intended to attract advertisers. (Public television stations, are not a major source of information on user characteristics for this study because, in most cases, surveys of the audience have not been conducted.) Despite these qualifications, some data are available on teletext and videotext usage. This section discusses both private and institutional users of the services.

1. Private Usage

   a. User Characteristics. Teletext and videotext users at this early pre-introduction stage tend to be male, highly educated, affluent and in the 20 to 50 age range. In addition, participants are generally high-tech oriented and are heavy users of other information sources such as television, magazines, and newspapers. There appears to be little difference between teletext and videotext users. (Findings on teletext and videotext users must be cautiously interpreted because data on experiment participants is heavily dependent on the selection of participants).

   b. Viewing Preferences. Teletext viewers in experiments preferred news, weather, sports, guides to entertainment, features, and business. Videotext viewers for one service (CompuServe) did not frequently access current news but were interested in editorial items. Participants involved in the Florida Viewtron experiment were most likely to access news, bulletin board, and local entertainment sections. In addition, shopping was a popular service, with 68 percent of the households using this feature.

   c. Amount of Usage. Data on the amount of usage of the service is extremely limited. KCET reports that the households involved in their teletext experiment averaged 15 minutes a day, accessing 84 pages. WETA reports a marked decline in the use of teletext over the course of the experiment. Communication Studies and Planning International estimate that consumers will access a 250 page teletext system an average of 1.4 times per day for a total daily viewing time of 11 minutes. The Times Mirror videotext field trial reported an average of 2.1 sessions per day per household for a total viewing time of 46 minutes.

2. Public Usage. Information on teletext and videotext usage through public access is quite limited due to the few experiments that have been conducted on this basis. Information is further limited because research was conducted only on the WETA experiment in which decoders were placed in ten locations. Results from this experiment indicate that the public was interested in the service and that many users would be willing to purchase a decoder. As with private usage, users were more apt to be male and relatively young.

D. Summary. At present, teletext and videotext usage is extremely limited, and, in fact, few people have even had the opportunity to try the services. Much of the use has been on an experimental level and, until more publicly available services and decoders are offered, one cannot make any generalizations on the intensity of demand. Although test have shown that users are interested in teletext, it remains to be seen how attractive a service it will be over time. Videotext usage, defined to include text only offerings, is more widespread at this time and shows signs of the beginning stages of growth. However, text and graphics videotext services constitute new products on the market and actual demand is still uncertain.

VI. SCENARIOS OF MARKET EVOLUTION

This section describes our perceptions of the nature of the teletext/videotext industries and to some extent the likely developments in those markets during the next 5 years. A presentation of projected market growth is followed by discussion of likely developments in six major areas.

A. Projections. Based on current industry estimates, the range of projected penetration is as follows:

RANGE OF PROJECTIONS
(% of households)

	1985	1990	1995
Teletext	5-7	15-90	30-90
Videotext	2-5	7-20	10-40

The extreme ranges for the projections reflect two basic factors: varying definitions of what constitutes teletext/videotext and tremendous industry uncertainty regarding the product's actual market appeal and potential. As the chart reveals, low growth for both teletext/videotext are expected through 1985. After 1985, teletext growth is likely to accelerate more rapidly than videotext. By the end of the century, however, both teletext and videotext will presumably have attained similar levels of market penetration. IRD predicts that by the 1990's 70% of domestic videotext households will be accessing videotext systems from microcomputers. The remaining 30% will utilize dedicated terminals. (Arlen 2/83)

B. Equipment. In this area, developments over the next five years will concentrate on continued technical refinement and efforts to produce the equipment inexpensively and en masse. Advances in the following specific areas are likely:

- Addressable teletext. Smart cards and other methods of decoding specially scrambled offerings should become cheaper, and more prevalent.
- From the system operator perspective, problems with ghosting and poor reception will be addressed and largely resolved.
- Systems may be developed that combine teletext and videotext capabilities.
- Decoders and terminals will have increased capabilities, placing heavy emphasis on the end users' data storage, memory capacity and telesoftware versus conventional data transmission and almost exclusive dependence upon the host computer for computations, etc.
- Integration of teletext/videotext system components with other telecommunications and computer technologies will become more widespread.

C. Cost. The extent to which equipment costs drop during the next five years is highly dependent upon how popular the products become and, thus, the degree of mass production. Common industry predictions are as follows:

- Stand-alone teletext decoders with enhanced memory and "software" capabilities will cost between $100 and $150.
- For approximately $50 over regular price, televisions will be available with built-in decoders.
- Dedicated videotext terminals with NAPLPS compatability will be priced under $500.
- Dedicated text-only videotext terminals will cost under $100.
- System operator costs will continue to decrease as equipment such as computers, page creation terminals, etc. are improved and mass produced.

D. Standards. Although a decision by the FCC would settle this matter quickly, such an action is unlikely. Nonetheless, this issue should be resolved within the next three to five years either through a marketplace determination of a single standard or through the introduction of systems compatible with multiple standards. NABTS and NAPLPS will dominate.

E. Personal Computers. Personal computers will provide a large market for videotext. Most PC's will be available with NAPLPS capability. Prices will continue to fall, perhaps to as low as $50 for reasonably sophisticated systems. Videotext software costs will also be relatively low. In fact, by the fall of 1983, DEC expects to introduce a package for $220.

F. Demand. The evolution of market demand must be assessed with respect to four components: consumer awareness, users, marketing and promotion, user costs.

- Awareness will be widespread. Every household will not receive either teletext or videotext, but most people will be aware of the services and aware of the difference between products. This applies not only to teletext and videotext, but to the specific services within each.

- Users will consist of early adopters, institutions and professionals with relevant tax write-off capabilities. Teletext/videotext users will still be largely upscale in terms of education and income, although there will be movement towards general consumer acceptance.

- Marketing and promotion to stimulate and essentially "create" demand will be of critical importance. Demand must be generated not just for end users, but for advertisers as well. Substantial resources will have to be dedicated to the marketing functions of the business.

- User costs should decrease as the result of technical improvements and mass production of consumer equipment. If costs remain high, arrangements such as equipment leases and subsidies may be used to stimulate demand. In fact, to avoid the initial consumer investment costs altogether, "give-aways" are not inconceivable. This is especially relevant with regard to large institutions, such as schools, and would presumably follow the pattern set by personal computer manufacturers. Another possibility is that transaction providers, financial institutions in particular, may consider providing free terminals in selected homes.

G. Distribution.

- VBI Teletext will continue to be distributed via broadcast and cable. About eight lines of the VBI will probably be available. Line 21 will be reserved for closed captioning.

- Full Channel Teletext operations will be based on cable, Low Power TV (LPTV) and Multi-Point Distribution Systems (MDS). LPTV is expected to be quite inexpensive: approximately $100,000 to build. The projected growth rate for LPTV is high with approximately 450 stations expected by the mid 1980's. LPTV and MDS full channel teletext services will concentrate predominantly on specialized local services and will probably be well suited for educational applications. A final possible development is major broadcasters providing full channel teletext after "sign off."

- Videotext will become increasingly dependent upon hybrid means of distribution. These systems will probably use cable or MDS to the home and phone lines as the carrier for transactions, etc. Exclusive reliance on phone lines will diminish as a result of rising costs for local calls. In terms of two way cable, the current situation, characterized by excessive costs and inefficient technologies, is bound to improve. Furthermore, most new cable franchises require two-way capabilities. Despite these developments, cable based videotext will not be widespread during the time frame under consideration. Direct-to-Home Satellite Broadcasting (DBS) will probably not become a significant factor in this area during the next 5 years.

H. Investment and Return:

- Entry costs for both teletext and videotext will remain high during the time frame under consideration. As the technology and market become more clearly defined, development costs will decline. On the other hand, marketing costs will rise and keep the overall costs of entry relatively stable.

- The nature of risk will shift. The risks of missed opportunities and entry into an unknown field will become secondary to more traditional business risks. These include the consequences of poor targeting, over-extension, and competitive risks.

- Revenues for most systems will be derived largely from advertising. General magazine videotext services will obtain 50% to 75% of their gross revenues from advertising. If advertising and other services, i.e. pay per use or transactions, become lucrative, subscription rates may fall and in some cases even disappear. CSPI predicts that, based on 10% penetration, by 1990 revenues for videotext will reach nearly $500 million. With a 20% penetration rate, teletext will generate more than $130 million in revenues (CSPI). With significantly different projections, IRD expects videotext alone to account for approximately $1 billion in revenues by 1992. They contend that $640 million of that amount will be derived from "electronic yellow pages" types of information while the other $360 million will come from "archival" news related information. (Arlen 2/83) They also estimate that the (overall industry) revenue mix will be as follows:

  23% - subscribers
  28% - advertising
  34% - home shopping
  16% - messaging

- Profits will begin to materialize. Some industry observers claim that return on investment for teletext/ videotext operations will be at least 35%.

I. Services. Major teletext and videotext services will be largely national and will include some form of local component. Additionally, targeted, specialized services either by content or locale will continue to emerge. The types of services will be largely similar to those currently offered. Some primary distinctions will exist, however. For example, videotext will move away from a general interest focus and become oriented towards transactions, specialized information and services like electronic messaging. Teletext will target quick information and specialty or auxiliary services such as serving as "wrap arounds" or supplements to television shows or advertising. Competition in this market will force national services to be quite similar. Marketing and promotion will be aimed at differentiating services and promoting brand loyalty.

VII. OPPORTUNITIES AND OBSTACLES

An analysis of the current and expected teletext/videotext activities and trends led to the identification of a number of opportunities and obstacles. This section presents the major opportunities and obstacles and should not be viewed as all inclusive.

Obstacles:

There are seven categories of obstacles which inhibit the development of the teletext and videotext markets: demand, technical issues, financial considerations, timing, product limitations and regulatory uncertainities. Many of the obstacles described below are relevant to the overall market, others are only applicable to specific products.

A. Demand Uncertainities:

- Probably the greatest obstacle for this industry is the possibility that demand for teletext and videotext offerings may never progress beyond today's low levels. This would result primarily from the failure of service providers to create demand by offering a unique product with a clear and compelling use.
- Residential demand may not develop due to relatively high consumer costs and due to the widespread availability of traditional information and transaction alternatives. In the business sector, demand may not materialize due primarily to the marginal value teletext/videotex adds to on-line data base systems and due to the minimal need for graphics.
- There is a possibility that demand will develop, but not as currently anticipated. For example, the market may be driven so strongly by transactions that supplementary electronic information becomes unnecessary or limited.

B. Technical Issues:

- The most important technical obstacle is the lag in mass production of teletext and videotext decoders and terminals. Simply stated, the market will not develop if the price of consumer equipment does not fall.
- A second technical obstacle for teletext and videotext relates to the competition from alternative technologies. Developments in videodiscs, videocasettes, store

and forward messaging sevices and micro-computers may detract from the potential success of teletext and videotext.

- To date, the standards issue has been an obstacle to U.S. market development. There are three possible outcomes if resolution fails to occur in the near future:
  - Equipment manufacturers may remain unwilling to commit resources to this industry. Thus, market growth would continue to be blocked.
  - The market may develop but would be fragmented as the VCR market currently is.
  - Equipment may be produced that is compatible with multiple standards.
- A final barrier in this category arises from the fact that some of the technical problems for teletext/videotext services have not yet been solved. This is especially true for unconventional applications like telemonitoring via videotext.

C. Timing Tradeoffs:

Timing of entry into teletext/videotext is often considered an important market obstacle.

- The risks for early entrants are high because the investment requirements for market and product development are high and because the direction and scope of market development is uncertain. If in fact the market does not materialize, or pioneer organizations bet on the "wrong" products, early entry could be an expensive error.
- On the other hand, "crowding out" could be a problem for late-comers particularly in videotext. Because the market will probably not support a large number of national services, late entrants may be faced with two options. The first is to spend substantial sums of money in an attempt to dislodge market share from existing players. The second is to identify and exploit specific market niches.

D. Financial Considerations:

- A fundamental obstacle is the high cost of entry associated with sophisticated and/or extensive teletext or videotext ventures. Investment requirements for computers, software, programming and frame creation equipment are substantial.

- o Profit potential for this industry is uncertain and relatively long term. While projections for profit potential are promising, it may be at least five years before profits actually materialize.

- o Another financial obstacle is the time lag for returns. The absence of a critical mass of users is largely responsible for the delays. Substantial sums of money will have to be spent creating demand before returns will materialize.

E. Product Limitations/Considerations:

- o The fundamental nature of teletext and videotext products may themselves prove to be obstacles to market development.

  - While VBI teletext is inexpensive and easy to use, its limited capacity and capabilities restrict its possible applications.

  - Full-channel teletext has numerous potential uses. At present however, its success depends on cable penetration (currently 30% of all households) and the popularity of multi-tiered services among general subscribers. Significant churn in full-channel subscriptions will occur if the offering is not viewed as a unique, worthwhile service.

  - Telephone-based videotext services boast numerous applications, but may prove too expensive to use due to high telephone and usage charges.

- o Another product issue which presents a potential obstacle for industry participants is the possibility that teletext may be eclipsed by videotext. Technically, there is nothing that teletext can do that videotext cannot. Thus, if prices of videotext services and terminals drop significantly, demand for teletext may disappear.

F. Regulatory Uncertainities:

A final set of obstacles arise from an uncertain regulatory environment. Seven areas in particular, are subject to regulatory review: standards, access, copyright, privacy, consumer protection, content, competition and structure. Problems arise in these areas because the nature, timing and impact of policy developments are unknown.

Opportunities:

This section discusses the categories of opportunities in teletext and videotext. These opportunities are generally differentiated by three factors: the type and use of the information provided, the geographic distribution of the service, and the nature of the target audience. Three types of opportunities are independent of these considerations: operations as an umbrella organization, time of day programming and provision of peripheral industry services. For most opportunities there are varying levels of possible involvement.

A. National General Interest Services:

The number of national general interest teletext and videotext services will be limited. However, in almost all cases there will be opportunities to act in local feed and distribution capacities. These opportunities are relevant to all of the generic industry products.

National offerings currently under development reflect conventional industry belief that the local component is essential for establishing demand. Throughout the country, networks are being established between national systems operators and local newspapers, broadcasters, and cable operators. Opportunities also exist for information provision at the local level for local distributors or transmitters.

B. Targeted, Specialized Services:

At this time targeted, specialized offerings are limited in teletext and text and graphics videotext. Offerings of this kind would be geared towards a particular age, occupational or professional group or a specific locale or interest area.

Opportunities exist in full-channel teletext and any form of videotext to supply either an entire tier of specialized information or a more limited information product.

Specialized services could also be offered on a national basis if the targeted market is large enough, (like the business community) and distribution is economical.

For VBI teletext in particular, local services constitute another area of opportunity. These operations are generally feasible only if the investment requirements are low and the offering is relevant to the intended market.

C. Supplement to Television:

Providing information to supplement regular television programming is a natural market niche for VBI teletext. "Wrap around" services exploit both the timeliness of the medium and the ability to have information content correspond with broadcast programming. With technical advances and/or adjustments this opportunity may become feasible for full channel teletext and videotext as well. These offerings may consist of additional information on program subject matter, study guides for educational programming, etc.

D. Value Added Advertising:

Value added advertising, which would generally consist of infomercials, consumer information, and how to use demonstrations presents an opportunity to teletext and videotext services with graphics capabilities.

Four areas of opportunities - public service, business, education, and entertainment-can be exploited on the basis of either CUG uses or highly targeted, specialized services. The following sections identify and briefly comment on the specific potential offerings.

E. Public Service:

Public service opportunities include providing: consumer information; translation and captioning; federal, state and local government information; hotlines and local emergency information. Teletext is suited for all but one of the above applications. Hotlines require interactivity and thus are only appropriate for videotext.

F. Business:

Most opportunities within the business domain require interactive capabilities or extensive and specialized information and are applicable to videotext only. Sample applications include Continuing Professional Education (CPE) courses, in-house training programs, and electronic messaging.

G. Education:

Educational programming in the following areas can be provided by teletext or videotext: basic literacy exercises; placement examination aids for the GRE, SAT, etc.; correspondence courses and extensions to regular school materials. While teletext would be suitable for these applications, videotext's capacity and interactivity make it more effective.

H. Entertainment:

Opportunities in teletext/videotext services vary from providing alternative children's programming to offering traditional and/or educational videogames. To be attractive, each of the applications would presumably require graphics. The alternative programming can be via teletext or videotext. Videogames on the other hand normally require interactive capabilities and thus could only be provided by text and graphics videotext.

I. Peripheral Services:

Opportunities may arise in the area of peripheral services. Training, page creation, service and maintenance and packaging, for example, could be provided on a contractual basis. These services would compensate for the absence of in-house capabilities.

J. Time-of-Day Programming:

Time-of-day programming presents an opportunity for VBI teletext as an alternative to the magazine format. Applying this traditional approach of broadcast programming to teletext increases the user base of a system by attracting different groups of users at different times of the day. This appears to be the most practical method of overcoming the page capacity constraint of VBI teletext.

A representative program schedule might include the following:

- Early morning - News and Weather
- Mid morning - Education
- Early afternoon - Cooking/Recipes
- Late afternoon - After School Programming
- Evening - News Update

- Late Evening - Targeted Instruction
- Late Night - Data Transmission

K. Umbrella Organization:

The opportunity to serve as an umbrella organization to multiple information providers is most relevant to full-channel teletext and videotext system operators. In this context, the focus is on style and quality control. The functional responsibilities consist primarily of management, packaging, distribution and sales.

The existence of organizations of this nature presents important opportunities to IPs, especially those with highly specialized types of information.

Appendix II

Institutional Assessment

INSTITUTIONAL ASSESSMENT

I. INTRODUCTION

Two basic questions have guided the analysis of opportunities for the public television system in teletext and videotext:

- What are the prospects for new ventures that are self-supporting and enhance the mission of public television?
- What are the prospects for new ventures that, by increasing public television revenues, can contribute to the mission of public television?

The situational assessment approached these questions by analyzing the characteristics of teletext and videotext. This institutional assessment considers the characteristics of the public television system that can support a new venture. Our analysis has led to five major conclusions.

1. New ventures entered into by public television should meet three basic criteria. Specifically, ventures should:

   - be consistent with public television's mission
   - have minimal financial risk,
   - add to (or not detract from) funding base.

   These criteria establish a filter that limits the range of options available to public television in teletext or videotext.

2. The mission and infrastructure of public television are not designed to be consistent with earned income generation. The infrastructure of the system is designed to serve the goal of providing high-quality non-commercial programming and is not geared to supporting income-generating operations. Public television does not have a line of business

organization and lacks financial controls, information systems, marketing and management capabilities that are focused on earned income ventures.

3. Public television has valuable network-level resources to bring to new ventures. While important resources exist on the local level, the value of the satellite and vertical blanking interval (VBI) are enhanced in network applications.

4. The organizational structure of public television inhibits network ventures. Because the system is structured to foster the responsiveness and flexibility of local stations, centralized decision-making and risk-taking resources are limited.

5. Basic conflicts exist between the mission of public television and its financial imperatives and between the network advantages and the organizational structure. While ventures must adhere to public television's mission, current financial constraints lead to the requirement that ventures must be self-supporting. At the same time, however, the infrastructure does not lend itself to earned income projects. In addition, while the major resource advantages point to network ventures, the organizational structure supports local applications. Although these two conflicts do not preclude public television from entering a new venture, they must be carefully addressed before any action is taken.

The following sections (1) describe the analytical framework used to assess the public television system's posture towards new ventures; (2) discuss major institutional issues within the context of that framework; (3) present public television's strengths and limitations; and (4) consider possible roles for the system in teletext and videotext.

II. FRAMEWORK OF ANALYSIS

A. Introduction

To conduct the institutional assessment a matrix was developed for public television in order to view the opportunities from several perspectives. Criteria to be met by new ventures were established. The perspectives on public television and the criteria were used as standards in evaluating the institutional issues throughout the analysis.

B. Perspectives on Public Television

The public television system's ability to enter the teletext or videotext market cannot be assessed from only one perspective. Opportunities are available at different levels of involvement and to serve different purposes. Institutional strengths and limitations vary across perspectives. A matrix that provides a basic framework for the various perspectives available within public television is shown below. The axes are venture participants and purpose of venture.

		Network	Station Groupings	Single Stations
Public Service	No earned income applications			
	Possible earned income applications			
Earned Income	Directly related to mission			
	Indirectly related to mission			

This matrix indicates that decisions on new ventures must be made at several levels. Opportunities are available for the network as a whole, for stations grouped by region or by operating characteristics, and for local stations. In addition, new projects can be under consideration for a variety of purposes ranging from enhancement of the public mission to sheer earned-income generation. These divisions are often not clearly drawn: differences in purpose may not be well-defined and the number of stations grouped together can increase to the point where they approach network capacity.

Differences in perspective affect institutional characteristics that are considered in the evaluation of new ventures. A venture under review for the network solely for public service requires quite different types of funding, organizational structure and management capabilities than a venture undertaken by a single station to generate earned income. Furthermore, interest in new ventures will vary among stations according to each station's individual operating characteristics.

C. Criteria for a New Venture

Five basic internal criteria should be considered in evaluating new ventures.

1. Consistency with mission. A venture should be either directly supportive of the mission of public television or indirectly supportive by increasing the funds available for public service applications.

2. Funding. Funding must be available to initiate the new venture and to continue the venture past the development stage. At the same time, funding for new ventures must not come at the expense of public television's capacity to provide its primary service. Funding sources can vary from joint venture participants, donations, institutions, operations or others.

3. **Organizational Structure.** The organizational structure must provide the appropriate decision-making and risk-taking capabilities necessary for the selection and implementation of new ventures. This structure should already exist within the organization or be readily adaptable.

4. **Appropriate Infrastructure.** The skills necessary to operate the new venture should be either in place or easily accessible. Types of necessary skills depend to some extent upon the venture under consideration but include such areas as technical expertise; planning and management capabilities; and marketing abilities.

5. **Value Added.** The venture participants must possess something of value to contribute to the venture. Either the proposed venture should augment public television's strengths, or, if a joint venture is under consideration, public television should be able to "bring something to the table".

Although all of the criteria need not be met to select a venture, it is unlikely that a venture will be undertaken without meeting at least one or more of the criteria. The importance of the criteria is dependent on the type of venture under consideration. For example, a venture involving leasing the VBI to another operator need only meet the value added criteria, while a venture relating to a national teletext magazine should meet all five criteria. In particular, the requirement for funding is clearly a prerequisite. It should be emphasized that these are criteria necessary from a participant point of view. The criteria required for the sucess of a venture from the market point of view such as it must be a well-defined product or aimed at a specific market, are discussed in the third section of this report, Strategic Assessment.

III. INSTITUTIONAL ISSUES

A. Introduction

The effect of institutional characteristics of the public television system on its ability to enter the teletext or videotext market is discussed in this section. The characteristics have been divided into eight major areas:

- Mission
- Financial Considerations
- Administrative and Regulatory Constraints
- Organizational Structure
- Resource Advantage
- Management Expertise
- Audience
- Teletext and Videotext Experience

B. Mission

The mission of public television is to produce innovative, high quality, non-commercial programming. The interpretation of this statement varies across stations and has a strong impact on the types of teletext or videotext ventures individual stations would consider.

1. Sources of variation of interpretations. Several factors affect each station's attitude towards earned income ventures. These factors include funding sources, type of license, level of funding, and management outlook. Because each station faces various sets of conditions, each station's concept of legitimate activity will be different.

2. Range of interpretations. There are three basic attitudes within the public
213 television network towards earned income ventures. Some stations find that ventures with 214
any commercial overtones are inappropriate and may alienate current funding sources.

Other stations consider ventures acceptable if they are self-supporting through earned income. A third group of stations believe that earned income ventures can provide an important source of funds for additional public service programming.

3. Advertising experiment. The effect of the different interpretations of what constitutes legitimate activity on stations' attitudes towards new ventures was reflected in the response to the advertising experiment. Although this experiment cannot be equated with a teletext or videotext venture, the fact that only 16 of 296 stations applied for participation indicates that many stations are wary of earned income ventures.

4. Teletext and Videotext applications. The different approaches of stations to earned income ventures strongly affect the types of teletext or videotext ventures that will be appropriate. Some stations will look to these new services solely for their public service applications, and others will want to offer services that can be self-supporting through underwriting, advertising, or on the basis of a joint venture or consortia (with local institutions). A third group of stations may look to sheer earned income applications in order to gain additional revenue or funding sources.

C. Financial Considerations

Before considering a venture in electronic publishing, whether on a network or a station-by-station level, the financial condition of the public television system must be understood.

1. Discretionary Funds. Over 60 percent of the total revenues of public television is used for program production and acquisition or for technical expenses. These costs are essentially fixed unless program or technical quality is reduced. After accounting for operating and equipment expenditures, less than 2 percent of revenues is left for unfore-

seen and discretionary expenses. Inflation and competition for programs will place additional pressure on already narrow operating margins. Public television therefore faces both a scarcity of existing funds for operations and the need to develop new sources of funds.

2. Risk aversion. The risk aversion displayed by most public television stations is understandable because it reflects two factors. One, stations lack discretionary funds, and two, their revenue sources are unstable. While the magnitude of possible financial returns has some importance, the timing and certainty of returns is of greater importance. Stations do appear willing, however, to take technological risks, if the funds used are not their own. The risk aversion of the stations and the fact that profits from videotext or teletext may take three or five years to materialize, if they materialize at all, may limit the potential opportunities for public television in these areas.

3. Station Differences. The financial condition of stations varies. While some stations have relatively large financial reserves, others have little or none. Some stations have done well in the recent recession; others have not. Borrowing capacity or ability also varies. The fact that financial strength is variable has special meaning for system-wide ventures and for ventures involving groups of stations. In these situations, the quantity of in-depth financial analysis required emphasizes the need for appropriate financial and accounting systems. In addition, special attention must be focused on providing resources for contingencies.

4. Reaction to Federal Cutbacks. Various financial projections have been produced by the CPB's Planning and Analysis Group. Expenses were projected on the basis of outlays
217 necessary to maintain current levels of service. Due to the nature of nonprofit organizations, shortfalls between projected revenues and projected expenses will be referred to as 218

service losses rather than deficits. In 1981, the last year for which complete data were available, service losses were projected at $10 million to $15 million. Although federal support was $11 million less than expected, the public television system had a small surplus of funds. Possible reasons for this surplus are:

- Stations have offset federal cutbacks by increasing revenues from other sources.
  - Subscriber revenues were up $22 million or 30 percent in 1981, with a similar increase in 1982.
  - Business revenues were up $15 million in 1981.
- Stations have reduced operating and capital expenditures.
  - Capital expenditures were down $10 million from 1981 projections.
  - Operating expenses were down $3 million.
- Stations have been energetic and innovative in their fund-raising, both in finding new sources of funds and in using the publicity surrounding federal cutbacks as a catalyst for fund-raising activities.

5. Conclusion. Whether the public television stations can continue to acquire the resources needed to maintain or improve the quality of their services is a question that will be answered in time. It seems unlikely, however, that the stations or the network can afford the investment required to enter the teletext or videotext market on a full-scale basis without substantial financial support. The current financial condition of public television dictates that in general a venture in teletext or videotext should be considered only if it involves little or no capital investment by the stations, or if it offers a reasonably certain and timely return on investment.

D. Administrative and Regulatory Constraints

Administrative and regulatory constraints placed on public television limit possible venture opportunities beyond the limitations imposed by financial considerations.

1. CPB Restrictions. Section 399b of the Communications Act of 1934 as amended by the Public Broadcasting Amendments Act of 1981 restricts public television's entry into for new ventures in two ways:

- Section 399 b(b) states that public broadcasting may not engage in activities which interfere with their public mission.
- Section 399 b(c) states that federal funds available to CPB may not be applied to commercial activity.

This section dictates that CPB may not grant funds to stations for commercial purposes. (Funds available from other public sources, however, are not subject to the same restrictions.) Thus, stations interested in earned income ventures must seek funding from sources other than CPB. Furthermore, stations must be careful not to engage in activities which would interefere with their public mission. Although there are no restrictions on commercial activities *per se*, the non-interference clause means that earned income activities must be certain not to interfere with other activities.

2. PBS Policies. The PBS policy for new ventures is that public funds should not be placed at risk. This policy inherently limits the size and experimental nature of new ventures, unless funds can be made available from other sources. Any earned income venture coordinated by and involving risk to PBS would need a non-public source of funds.

3. FCC Ruling. The May 20, 1983 FCC ruling on the transmission of teletext by TV stations specifically authorizes public television stations to offer teletext services on a "profit-making" basis. The Commission was of the opinion that "remunerative teletext activities would not constitute ... interference". While this ruling would appear to clear the way for earned income teletext ventures, it arguably violates the non-interference statute and could be subject to a petition for reconsideration. It is conceivable, for instance, that if a network public service teletext magazine were offered, stations providing earned income services could still be subject to the non-interference clause.

4. Decoder Availability. An additional question of the appropriateness of teletext or videotext for public television is raised by decoders. Because public television is supposed to be just that, i.e., available to the public, questions are raised concerning the appropriateness of public television's provision of a service that requires the purchase of an expensive (at least for the present) decoder. This concern may be met with the observation that public television already requires the purchase of a television. Another solution to this problem would be services geared to public access, for example programs available to schools or local governments.

5. Summary. Administrative and regulatory constraints do not, specifically, restrict public television from earned income ventures, but they inherently limit the type of ventures that are likely to be attractive. From an organizational point of view, public service ventures are desirable, and public funding could be applied to them if it were available. Earned income ventures can receive no public funds and may be viewed as being at cross purposes with public television's mission.

E. Organizational Structure

The organizational structure of public television promotes station initiative, but hinders network action. Although all of the networks experience affiliate independence to some degree, station initiative and independence are considered to be major strengths of public television. As stated in the 1981 Annual Report of CPB, "American public broadcasting is the most decentralized, diversified broadcasting enterprise in the world."

1. CPB Policy. Station independence is fostered in part by CPB policies. Grants are distributed to individual stations with few restrictions (other than those discussed relating to earned income activities) and local community service is encouraged.

2. PBS Structure. Because PBS is structured as a membership organization, centralized decision-making and risk-taking resources are limited.

3. Implications for Network Ventures. The organizational structure makes teletext or videotext ventures on a network level difficult, because no central agency exists that can compel stations to implement decisions. Although the commercial networks face similar problems in that stations do not have to carry the network teletext feed, they do have the centralized resources to decide on a teletext service, to develop it, and to bear the risk of the new venture.

4. Single Station or Grouped-Station Services. Single station or grouped-station services are favored by the organizational structure The PBS experiment with Merrill Lynch provides a good example of this: PBS could more easily gain agreement on the experiment from three stations than it could from the entire network. Another example of station groupings is the USDA Infodata experiment, where stations with large agricultural constituencies could carry the service if they were interested.

F. Resource Advantages

Five major areas can be considered potential advantages for public television in teletext or videotext ventures.

1. Satellite Distribution The satellite clearly provides a major resource for teletext ventures. It provides an instant, inexpensive means of communication and capacity is available. The satellite confers an advantage to network ventures: while local stations could use the satellite, their access is limited and their need of the satellite for local operations is in effect non-existent.

2. VBI. The VBI is a necessity for teletext. It can be viewed as a property that public television either wants to use itself or to lease to others. The VBI's value is enhanced at the network level because a wider audience is reached and because the system unit costs of capital and operations decrease as stations are added to the service.

3. Network. The public television network itself can be viewed as a resource, providing local station penetration and wider audience exposure.

4. Reputation. Public television's reputation for high quality programming in the performing arts and education is a resource. In addition, public television is the sole entity that has a commitment to public service on both a local and a national basis and that is easily accessible as a conduit for public service activities. Institutions such as museums, state or local governments, and school systems may be interested in funding new ventures geared to public service applications for their constituencies. While such ventures could be viewed as quasi-commercial in that funding would be provided for a specific service, they would be carried out in the spirit of public service.

5. *Experience*. The experience gained from the teletext and videotext activities conducted by several public television stations confers an advantage. However, this advantage will probably erode over time as more groups become involved in teletext and videotext and develop their own technical expertise in the field.

6. *Summary*. Public television's major resource advantages are enhanced by network teletext applications. Although public television does have some videotext experience, its other assets--the satellite distribution system, the VBI, and the network--are geared towards teletext.

G. Management Expertise.

Public television's management structure is currently geared towards local initiative and non-commercial activities. While this structure serves public broadcasting's public purpose and allows stations to produce and distribute high quality programming and to raise funds, it is not the structure necessary to enter into and support new ventures, particularly earned income ventures. The specific management capabilities that are in short supply are discussed below.

1. *General Management*. Although public television clearly can manage its public service, not-for-profit activities well, the general management skills required for earned income ventures are not obviously present.

2. *Planning and Evaluation*. Planning and evaluation skills are extremely important when entering a new venture, particularly ventures in a risky or experimental area such as teletext or videotext. Opportunities should be evaluated by forecasting results and establishing criteria to measure the results. Sources of funding must be identified, timetables established, contingency plans set, and goals and objectives delineated. These

tasks must all be accomplished with a thorough understanding of the public television environment.

3. Marketing. The importance of marketing cannot be over-emphasized in the early stages of teletext and videotext. An intensive marketing effort will be required both to inform viewers of these services and to develop financial support for the services from underwriters, donors, or advertisers. While public television stations are well-skilled in fund-raising, the marketing of teletext, which will require a learning process for potential donors or advertisers, calls for skills that are not identical to fund-raising.

4. Financial Information Systems. Any new venture, and particularly earned income ventures, will require constant monitoring. Data on operations will be necessary for the planning and budgeting process and for evaluating the performance of the venture. At present, most public stations do not have financial information systems geared to provide such data.

5. Finance. Financial skills are also needed for new ventures. They will be required for initially raising capital and they will be necessary for on-going operations to manage cash, to allocate resources, and to project future activity.

6. Summary. While public television's management structure supports its current activities, it lacks certain skills necessary for earned income teletext or videotext ventures and it may be insufficient in certain areas for public service ventures. These skills cannot be treated lightly; without them stations could encounter serious financial difficulties. Stations that want to engage in new venture activity should make a commitment to acquiring the skills and systems necessary to analyze, manage, market and evaluate the new activity.

G. Audience

The audience for public television generally mirrors both population and commercial network demographics. Although public television's share of total television hours is less than that of the commercial networks, it is likely that public television viewers are more attentive to the programming than are commercial viewers. The audience conveys both comparative advantages and disadvantages in the context of teletext and videotext.

1. Comparative Advantage. Because public viewers are generally more attentive to programs than commercial viewers, they may be more positively oriented to teletext than commercial viewers. Furthermore, because these viewers are attracted to a specific show, teletext viewing is not likely to decrease the viewership for ensuing programs.

2. Comparative Disadvantage. The demographics of public television's audience are comparable to those for commercial networks, except that public television has a lower share of total viewing hours. These demographics do not provide public television with a comparative advantage for commercial advertising either in scale or in terms of teletext early adaptors.

3. Summary. The audience for public television conveys both advantages and disadvantages to potential underwriters, advertisers, and information providers. On the one hand, viewers of public television may be more apt to view teletext than commercial network audiences. On the other hand, public television viewers do not offer advertisers superior demographics or scale of audience.

H. Teletext and Videotext Experience

The chart on the following page summarizes the activities of public television in teletext and videotext. Several points emerge from this chart.

1. Product. Activities predominantly have involved Line 21 services. Of the 19 stations participating in teletext or videotext experiments, only six stations have provided teletext services using other lines of the VBI, and of the six, three are involved with the Merrill Lynch experiment. Three stations have had experience with videotext.

2. Orientation. Almost all services have had a public service perspective. The two exceptions are the Merrill Lynch experiment and KCET's electronic billboard service. These are in addition the only services that are solely aimed at earned income generation. While revenues are a factor in other services, this component is generally of minor significance. For example, the source of revenue for many of the services is a percentage of decoder sales revenue.

3. Target Audience. Many of the activities are aimed at targeted audiences rather than the general public. Groups particularly focused on are schools, farmers, and the hearing impaired.

4. Equipment. The equipment used in many activities has been provided by outside organizations, such as equipment manufacturers or information providers, who are interested in teletext or videotext.

5. Summary. Public television's experience in teletext and videotext points to the system's strengths and limitations in this area. In teletext, the VBI is certainly a strength and the experience in public service programming provides an advantage. In

PUBLIC BROADCASTING ACTIVITIES IN ELECTRONIC PUBLISHING

STATION	PRODUCT	ORIENTATION	TARGET AUDIENCE	PHASE OF OPERATION	CURRENT STATUS	COMMENTS ABOUT EQUIPMENT
KBIN	Passive Text-Line 21	PS	Agriculture	O	Ongoing	
KCKT	Passive Text-Line 21	REV	CUG	C	Ongoing	
	VBI Teletext	PS/REV	General Public	E	Suspended	Antiope - Donated
KPBS	Text & Graphics Videotex*	PS/REV	General Public	E	Ongoing	INDAX - Provided by COX
KUON	Passive Text-Line 21	PS	General Public/ Hearing Impaired	O	Ongoing	
	Text & Graphics Videotex*	PS/REV	General Public	E	Ongoing	INDAX - Provided by COX
KWCM	Passive Text-Line 21	REV/PS	Agriculture	O	Ongoing	
WETA	VBI Teletext	PS	General Public/ Public Access	E	Ongoing	Telidon - Purchased
WGBH	VBI Teletext	PS	CUG-Schools/Public Access	E	Ends 6/83	Antiope - On loan
WHA	Passive Text-Line 21	PS	Agriculture/Hearing Impaired	O	Ongoing	
WILL	Passive Text-Line 21	PS/REV	Agriculture/Education	O	Ongoing	
WUFT	Passive Text-Rotatex	PS	General Public	O	Ongoing	
WOUB	Text only Videotex	PS	General Public	Research	Ongoing	
Merrill Lynch Project:	VBI Teletex	REV	CUG	E	Startup	Provided by Merrill Lynch
WNET						
WPBT						
WTTW						
USDA Infodata Project	Passive Text-Line 21	PS/REV	Agriculture	E	Ongoing	Provided by USDA
KFME						
KWTF						
KRMA						
KOZK						
WEDU						

KEY:

Passive Text - Passive VBI Teletex
VBI Teletex - Selective VBI Teletex
PS - Public Service
REV - Revenues
O - Operational
C - Commercial

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videotext, activity has been limited and focused primarily on educational or institutional programming. Organizational weaknesses in network programming are seen in the fact that all experiments have involved single stations or station groups and financial limitations are mirrored in the provision of equipment by outside organizations.

IV. Strengths and Limitations

A. Introduction

This section discusses the strengths and limitations of public television in the context of entrance into teletext or videotext ventures. The findings are drawn from the institutional issues and applied to the criteria for new ventures discussed in Section II, Framework of Analysis.

The strengths and limitations are summarized in the exhibit on the following page for each of the perspectives on public television. Several points of discussion are raised in the exhibit:

- Both strengths and limitations are encountered from all perspectives on public television. No category of venture can be immediately eliminated, nor does one category emerge as clearly superior.
- A simple comparison of totals of strengths and limitations is not possible. That is, one cannot say earned income network ventures are ill-advised because there is only one strength against four limitations. In this case, the potential value from the resource advantages - the satellite, the VBI, and the network - may well outweigh the limitations, and joint ventures could be the solution to overcoming funding and management problems. In another example, although a public service network venture has several strengths, funding difficulties may entirely preclude such a venture.
- Funding difficulties are present from all perspectives on new ventures and are a major limiting factor for any teletext or videotext venture.
- 241 Conflicts described in Section I between the mission of public television and its financial imperatives and between the network advantages and the organizational structure are clearly delineated in the exhibit. 242

STRENGTHS AND LIMITATIONS
OF PUBLIC TELEVISION IN IN RELATION TO NEW VENTURES

NETWORK		STATIONS	
STRENGTHS	LIMITATIONS	STRENGTHS	LIMITATIONS
• Consistent with mission • Funding from public sources available, but... • Resource advantage	• Organizational structure • Sufficient funding may be lacking	• Consistent with mission • Funding from public sources available, but... • Local fund raising techniques • Organizational structure • Resource	• Sufficient funding may be lacking
STRENGTHS	LIMITATIONS	STRENGTHS	LIMITATIONS
• Resource advantage	• May interfere with mission • Organizational structure • Inappropriate infrastructure • Sufficient funding may be lacking	• Local fund raising techniques • Organizational structure • Resource	• May interfere with mission • Inappropriate infrastructure • Sufficient funding may be lacking

B. Major Strengths

The two major strengths that public television brings to teletext or videotext ventures are described in this section. The discussion of how to enhance these strengths is presented in detail in the Strategic Assessment.

1. Resource Advantage of VBI. The VBI is truly a scarce resource. Only public television and the three commercial networks have access to the VBI on the network level. It can be used by public television itself, either on the station level or as a network, or it can be leased to other organizations, either for commercial or for public sevice purposes. The value of the VBI is enhanced by the satellite distribution system because local penetration is greater and because of cost advantages.

2. Public Service Mission and Reputation. The public service mission and reputation of public television on a network and local basis is unique in the broadcasting industry and consequently is a major strength on all levels. While funding constraints may make it difficult for public television to take full advantage of this resource, consortia with other public service institutions may offer a possible solution. The fact that many stations are affiliated with local universities makes the possibility of consortia appear promising.

C. Major Limitations

The major limitations faced by public television entering into teletext or videotext ventures are listed below. Possible means of overcoming them are described in the Strategic Assessment.

1. Funding Constraints. The capital and operating costs of teletext and videotext services in the face of public television's financial constraints make funding for new services a serious problem from every perspective. Although funds are technically available from CPB for public service ventures, it seems unlikely that funds sufficient for such services will actually be available. A possible means of overcoming this problem could be to enter into joint ventures or consortia with organizations who would provide at least the initial funds required for equipment.

2. Organizational Structure. The current organizational structure hinders the effective operation of a network-wide service and, in effect, forces new ventures to be on the station or station-group level. This limitation will be difficult to overcome because it requires at least a change in attitude and several institutional adjustments.

3. Business Expertise. The business expertise within public television in most cases is not sufficient for earned income operations. Unless steps are taken to acquire the necessary skills and integrate them into operations, new ventures must be non-commercial. Even at the non-commercial level, some enhancement of skills is necessary for stations considering entrance into the teletext or videotext market. Given the entrepreneurial nature of these new ventures, stations must be able to evaluate options, establish the appropriate management structure, and to monitor the performance of their activities.

D. Conclusion

While public television brings some major strengths to the teletext and videotext area, the organization faces major limitations that impose hurdles to their entrance into the market. Funding difficulties, organizational limitations and a lack of business expertise constrain public television's options. These problems are not insurmountable, but they must be seriously addressed before a major venture is undertaken.

V. Possible Roles

A. Introduction

This section delineates broad potential roles for public television in teletext and videotext. The roles are basically supported by public television's strengths and limitations and are not closely tied to specific service offerings.

Decisions made in this area are extremely complex; questions on several levels must be addressed. To focus the evaluation of ventures, we have divided the opportunities into classes:

Purpose: Public Service to Earned Income.

Organization: Network, Station-Groups, or Single Stations

Offering: Teletext or Videotext

Market: Residential, Institutional or Business

Role: Information Provider (IP), Transmitter(T), or System Operator (SO)

B. Findings

The exhibit on the following page presents an assessment of potential areas of opportunity for each of the classes. Two major points arise from this analysis:

POSSIBLE ROLES FOR PUBLIC TELEVISION
IN TELETEXT AND VIDEOTEXT

Teletext-VBI

	Network	Stations
Public Service	SO T IP	SO T IP
Earned Income	SO T IP	SO T IP

RESIDENTIAL

Videotext

	Network	Stations
Public Service	$IP_?$	IP
Earned Income	$IP_?$	IP

	Network	Stations
Public Service	SO T IP	SO T IP
Earned Income	SO T IP	SO T IP

INSTITUTIONS

	Network	Stations
Public Service	$IP_?$	IP
Earned Income	$IP_?$	IP

	Network	Stations
Public Service		
Earned Income	SO T IP	SO T P

BUSINESS

	Network	Stations
Public Service		
Earned Income	$IP_?$	IP

- Limited Opportunities in Videotext. Public television has neither the physical nor the financial resources necessary for entrance into the videotext market as a system operator or a transmitter. While it is conceivable that this market could be entered either in a joint venture or a consortia, the lack of a resource advantage on public television's part makes it unlikely that it would be considered in a partnership role. A role as information provider of educational videotext services is possible for individual stations, but unless these services are syndicated and distributed by the network, the network as an entity will probably not become involved with videotext in the near future.

- Teletext Opportunities. Teletext provides opportunities for public television in every feasible category. If the constraints of funding, organizational structure, and management capabilities can be overcome, opportunities exist in every sphere for public television as a system operator, transmitter, or information provider of teletext services. The large number of opportunities points to the need for careful evaluation of all ventures under consideration.

C. Conclusion

Possible roles for public television in videotext are extremely limited; teletext provides several opportunities if the limitations of public television can be addressed and overcome.

Public television need not select one single option. As is currently the case, different ventures may be carried out at one time or one type of venture can be pursued in the near term, while other ventures are entered into in the longer term. For example, given the current scarcity and cost of decoders, stations may want to offer free public access institutional services now and defer decisions on private access residential services until decoders are available.

Whatever roles are selected, however, it is extremely important for public television to develop services in the context of an overall network plan. Single stations or station groups should make decisions with an awareness of other station activity and the network should be in the position to serve as a coordinating body for teletext ventures.